

A New Database on Investment and Capital for Agriculture and Manufacturing

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Documentation for a new cross-country database on agricultural investment and capital, along with compatible measures for manufacturing and aggregate investment and capital.



Summary findings

In this paper, Crego, Larson, Butzer, and Mundlak document a new database on sectoral investment and capital, providing details about sources of investment data and the method used to convert those data series into capital stock series.

They also provide a copy of the computer program used to implement the method. The data set is available

for electronic distribution and will soon be posted on the World Wide Web.

They broadly define agricultural capital and calculate separate series for fixed capital as well as capital embodied in livestock and treestock.

This data set — a product of Rural Development, Development Research Group — was developed as part of a larger study of the determinants of agricultural growth. This paper was designed as a reference that the authors hope will encourage others to make use of the data and expand its content. Companion papers by the authors discuss alternative methods and discuss the connection between capital accumulation and growth. The study was funded by the Bank's Research Support Budget under the research project "Total Investment, Agricultural Investment, and Investment in Manufacturing" (RPO 680-50). Copies of this paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Pauline Kokila, room MC3-544, telephone 202-473-3716, fax 202-522-1150, Internet address pkokila@worldbank.org. Donald Larson may be contacted at dlarson@worldbank.org. November 1998. (55 pages)

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**A NEW DATABASE ON INVESTMENT AND CAPITAL FOR AGRICULTURE AND
MANUFACTURING**

Al Crego, Donald Larson, Rita Butzer, and Yair Mundlak

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Summary findings

This paper presents a new data base for sectoral investment and capital. The paper documents in detail sources of investment data and the method used to convert those series into capital stock series. A copy of the computer program used to implement the method is given as well. Agricultural capital is broadly defined and separate series are calculated for fixed capital, and capital embodied in livestock, and treestock.

The construction of the data set was part of a larger research effort to examine the determinants of growth in agriculture. Companion papers by the authors discuss alternative methods and discuss the connection between capital accumulation and growth. This paper is designed as a reference that will hopefully encourage others to make use of the data and expand its content. The data set is available for electronic distribution and will soon be posted on the World Wide Web. Currently copies can be requested by contacting Donald Larson at dlarson@worldbank.org.

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A NEW DATABASE ON INVESTMENT AND CAPITAL FOR AGRICULTURE AND MANUFACTURING

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INTRODUCTION

The purpose of this paper is to document a new cross-country database for agricultural investment and capital, along with compatible measures for manufacturing and aggregate investment and capital. Developed as part of a larger research project on the determinants of agricultural growth, the database fills what we see as a long-standing need to measure a primary determinant of economic production in a methodologically consistent way. A somewhat similar effort for a smaller group of countries was taken also by Ball *et al* (1993).

The paper reports the data sources used and the methods employed in calculating the capital series. A forthcoming companion paper will provide a description of the economic characteristics of the data set and will compare the resulting series with those generated by alternative methods. Related papers employing the data for analysis include Mundlak, Larson, and Crego (1997), Mundlak, Larson and Butzer (1997a) and Martin and Mitra (1996).

This paper is organized as follows. The body of the report discusses the methods used to convert measures of fixed investment, livestock investment and investments in orchards into measures of capital. There is an elaborate literature on the subject, but we chose not survey it here, because the procedure is in essence familiar. The purpose of our discussion is to outline the essential conceptual background for the decisions that had to be made in the construction of the series. Ball *et al* (1993) provide an eclectic discussion of the literature on some of the pertinent topics. The final section discusses the country and time coverage for the capital series as well as the investment series used as input for the fixed capital calculations. Annex I is a comprehensive list of sources for the data on deflators and investment in the agricultural and manufacturing sectors, as well as for the economy as a whole. Annex II gives the computer program, written in SAS and used to

calculate the capital series. A spreadsheet file containing the data is available for electronic dissemination. Please contact DLarson@WorldBank.org.

STRUCTURE OF THE SERIES

The series of overall agricultural capital presented here consists of three components: fixed capital, livestock, and orchards. These components account for most of agricultural capital.¹ As described in the United Nations System of National Accounts, fixed capital investment does not include direct investment in livestock or trees. Therefore, each of these components is computed separately. In addition we present a series for fixed capital in manufacturing and for the economy as a whole.

The construction of the fixed capital series is based on *aggregate* national accounts investment data. This construction requires the integration of the investment data to obtain capital stocks. On the other hand, the initial data for livestock and orchards are basically stock data for individual components. The construction of the aggregate series requires the aggregation of the different components. We turn now to describe the methods followed for each type of capital. The computer program in Annex II provides the details.

Fixed Capital

Let I_t be the investment made during year t , K_t be the capital stock at the *end* of year t and δ be the depreciation rate. Then, the capital formation is given by

$$K_{t+1} = (1 - \delta) K_t + I_t$$

Substituting back in time to an initial period, 0, we obtain

$$K_t = (1 - \delta)^t K_0 + \sum_{i=1}^t (1 - \delta)^{t-i} I_i$$

1 Other components are not covered by the series such as changes in inventory or on-farm land improvements.

To construct the series $\{K_t\}$ we need the depreciation rate and the initial capital stock, both of which are unknown and have to be estimated. We now discuss their calculation.

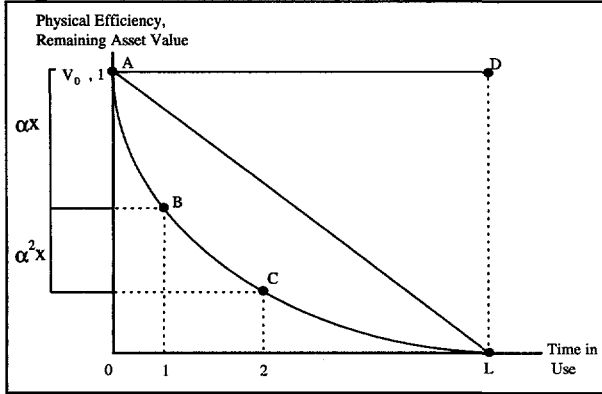
There are two concepts of capital of immediate interest in most economic analyses: physical productivity and value. Physical productivity indicates the potential contribution of the asset to *current* production. It can be measured relative to the initial productivity at the time of the purchase. The difference between the initial and the current productivity is the accumulated physical depreciation. Dividing the depreciation by the initial productivity gives the accumulated productivity depreciation in relative terms (with the initial productivity set at unity).

The value of the asset is the present value of the expected flow of net value output emanating from the use of the asset from the present to the end of its life. The accumulated depreciation is the difference between the initial value at the time of acquisition and the current value. Dividing the depreciation by the initial value gives the accumulated value depreciation in relative terms (with the initial value set at unity).

The concept of physical productivity is relevant for productivity analysis, or estimation of a production function. The value concept is pertinent to decisions on the ownership of the asset because it allows for the comparison at any time of its value in production with its market value. When the latter is higher, it is profitable to sell the asset. This is the essence of capital theory, and it applies to a machine as it applies to the time of selling stored wine or the cutting of a tree.

The time path of the productivity and the value of an asset are in general quite different because the productivity is related to the performance in a given period whereas the value covers more than one period. This is best illustrated in Figure 1, taken from Ball et al. (1993), for the case of a “one hoss shay” capital asset, such as a light bulb. The relative productivity remains constant at the initial value for the lifetime of the asset. Once the asset reaches the end of its lifetime (after L units of use), the productivity drops to zero. Plotting the asset's productivity versus its time in use yields a concave path, ADL.

Figure 1: “One hoss shay” capital assets



The value is determined by the following components :

1. the physical productivity of the asset at each point in time for the remaining life,
2. the expected price of the asset's net product,
3. a discount factor, and
4. the number of remaining years of service left for the asset.

In what follows, expected prices are taken to be constant, and thus the value time path depends on the decline in future performance due to the passage of time and the expected length of the remaining life. To illustrate, assume an asset of life length L that produces x dollars a year. Ignoring discounting, the value of the asset depreciates by x dollars with each year of use, and after j years of use the value is $(L-j)x$ dollars. This value falls linearly with time along the line segment AL in Figure 1. When we also discount the future returns from the asset, the value path changes to the graph $ABCL$ which falls below the path AL of the undiscounted value. The depreciation along this path reflects the decline in both the productivity of the asset and the discounted future returns. Consequently, the path $ABCL$, can be convex even when the productivity path is not.

To trace the behavior of the value over time, let the discount rate be α and the value of capital at the end of period 0: $V_0 = \sum_{i=1}^L \alpha^i x_i$. To simplify, assume $x_i = x$ for all i and write:

$$V_0 \equiv \alpha x + \alpha^2 x + \dots + \alpha^L x$$

$$\equiv \alpha x + V_1$$

$$\equiv \alpha x + \alpha^2 x + V_2$$

where V_j is the value, taken *at period 0*, of the income stream after j periods of use, or simply of an asset of age j . We can draw the value path to trace V_j as a function of j (the time use of the asset). For nontrivial discounting ($\alpha < 1$), we obtain $V_1 - V_2 < V_0 - V_1$ so that the value path is convex, as illustrated by the curve ABCL. In the extreme case of no discounting, $\alpha = 1$ and the path follows a straight line. This is an upper bound for the value curve, implying that, unlike the productivity path, it cannot be strictly concave.

Our procedure is to use the productivity depreciation, but the question is at what rate. The “one hoss shay” is an extreme case in the sense that the productivity does not decline throughout the use of the asset. More generally, the productivity of the asset depreciates with time and thus follows a concave curve. In this case, the path of the relative productivity at age j , S_j , can be formulated by (Ball et al, 1993):

$$S_j = (L - j)/(L - \beta j), 0 \leq j < L$$

$$S_j = 0, j \geq L.$$

where, L is the lifetime of the asset, β is a parameter bounded from above by one in order to restrict the productivity to be nonnegative. When new, the asset has a relative productivity of unity; when the asset expires at L , its relative productivity becomes zero, for $0 < j < L$, $dS_j/dj = L(\beta - 1)/(L - \beta j)^2 < 0$, indicating that the productivity falls with age (use). With a “one hoss shay” asset, β is unity and the productivity is unchanged for $j < L$, and when $j = L$, the derivative is undefined. In general, the speed of the change in the depreciation with age depends on the sign of curvature parameter β :

$$d^2 S_j / dj^2 = 2L\beta(\beta - 1)/(L - \beta j)^3 \quad \left. \begin{array}{l} > 0, \beta < 0 \\ < 0, 1 > \beta > 0 \\ = 0, \beta = 1 \end{array} \right\}$$

If β is positive but less than unity, $d^2 S_j / dj^2 < 0$, the depreciation accelerates with time (use) and the productivity curve is concave. Conversely, when β is negative, the productivity curve is convex.

In addition to the curvature parameter, the depreciation path depends also on the life span of the asset. Figure 2 illustrates the dependence of the productivity patterns on the parameters in question. It is drawn for the parameters used by Ball et al. for buildings and agricultural machinery: $\beta=0.75$, $L=38$ years for buildings and $\beta=0.50$, $L=9$ years for machinery.² These are the values they used to construct their data on agricultural capital which are based on data disaggregated into two categories: buildings and machinery. The data sources that we used do not provide any information on individual components (see Annex I for data sources). Thus the parameter values have to be chosen accordingly. A detailed discussion of the assumption of service lives in calculating capital stocks is given by Blades (1983).³ Judging the available evidence we used the following parameters (Table 1).

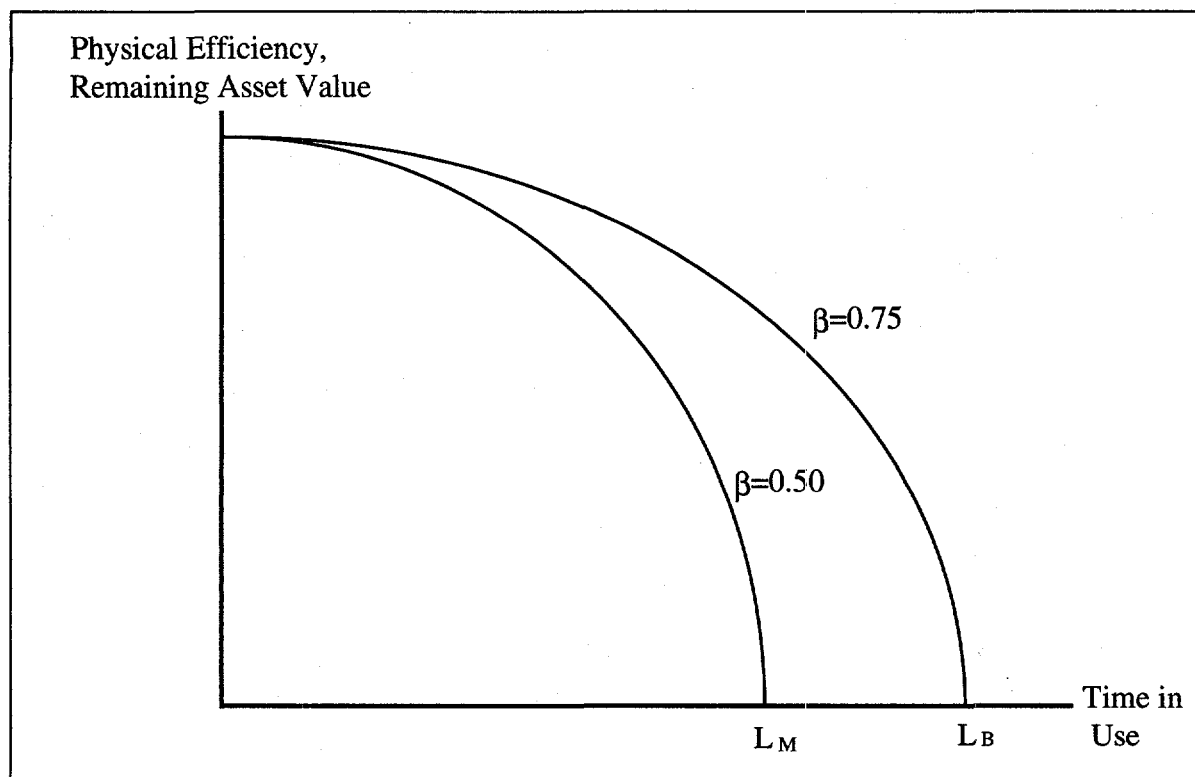
Table 1: Parameters used to generate capital stocks from investment data

Parameter	Agriculture	Manufacturing	Total Investment
Decay	0.70	0.70	0.70
Mean service life	20 years	15 years	20 years
Standard deviation	8 years	6 years	8 years

² Different capital goods have different decay parameters and different lengths of service life. Also, within each group, these two parameters may be stochastic. To aggregate such assets with different parameters, their distribution has to be established or, less desirable but more practical, to be assumed. The aggregation is then based on the assumed distribution. We do not have investment figures by disaggregated goods and will therefore ignore this topic of aggregation.

³ Blades (1983) reports average service lives by type of asset and sector for OECD countries along with the sources of the data. For machinery and equipment in manufacturing, the average service lives range from 10-33 years.

Figure 2: Effects of depreciation on physical efficiency



Using the values in Table 1, we aggregate the investment of different ages to obtain the capital stock accumulated over the period covered by the data. To complete the procedure, we need a value of the initial stock K_0 . Our procedure has been to generate investment data going back to 1913 rather than attempting to seed an initial value of capital. For the sample period, for each country, we regress the log of the ratio of investment to output on time. We then use the regression to “backcast” to 1913 this ratio, and use the output data to generate the needed investment data. Missing output data were similarly filled. In so doing, we introduce a probability distribution of actual service lives, leading to a distribution of productivity curves. The aggregation was done over investment of different ages and different productivity curves.

Livestock Capital

A considerable amount of agricultural capital is embodied in livestock herds. Herd sizes are monitored and reported by FAO. The values of stocks change constantly with the prevailing markets for meat and breeding stocks. Ideally observations on live animal sales prices would be used to value local herds, but these data were not

consistently available. In their stead, we used regional export unit values, based on FAO trade data to value domestic herds. Separate prices were calculated for cattle, sheep, pigs, poultry, etc. for each region by dividing regional dollar export values by regional export quantities. These unit prices were then applied to national herd statistics for each category of livestock. Dollar exchange rates were used to calculate nominal stock values in local currency.

Orchard or Tree Capital

Another significant investment in agriculture is represented by standing orchards, plantations, and smallholder trees. For some countries such as Indonesia, investments in palm oil, rubber and coconut trees represent a significant portion of agricultural capital. Similarly, coffee trees in Uganda represent a large share of agricultural investment.

Still, a lack of price and quantity data constrains the ease with which orchard capital can be estimated. There are no direct prices available for whole, productive trees. Neither are there data on quantities of trees. Available data, however, have been used in this paper to glean an indirect measure of the value of orchards. The methodology relies upon two pieces of information: the value of production and land area. The FAO maintains data that cover, for countries' major tree crops, area harvested by crop. The value of a tree in any period is the discounted stream of future revenues that it will yield through production, less production costs. Yield, in terms of revenue, is available by crop from the FAO. So, therefore, is yield per acre. The net revenue associated with each acre of tree crops is imputed forward in time (with discounting) and, when aggregated, taken as the value of capital in the form of trees.

Because trees die, future production capacity is limited. For some countries and some crops, it is possible to use historical planting data to discern the age of different cohorts of trees. (For example, the International Rubber Studies Group recently established a remarkable series on rubber plantings spanning the current century.) For our work, however, a simplifying assumption is made that at any point in time the average tree is halfway through its assumed lifetime. The assumed lifetime of trees can be easily adjusted within the computer program. A crucial assumption, however, is made

in moving from revenue per acre to profit per acre. The value of an acre of trees, of course, hinges on the profit that the acre will generate. There are no known, widely applicable estimates to account for per-acre production costs of countries' various types of tree crops. Again, a simplifying assumption is made that production costs represent about 80 percent of export value.

CHOICE OF DEFLATORS

Raw data on livestock and treestocks were reported in nominal US dollars, while data on investment in fixed capital were generally reported in nominal local currency units. For fixed capital calculations, nominal investment was converted to constant 1990 prices, using country specific investment deflators when they were available. More frequently, however, economy-wide GDP deflators were utilized. Investment in constant local currency was used to generate fixed capital of the same denomination. The aggregation of fixed capital with livestock and treestocks was done in nominal US dollars. For this purpose, fixed capital in nominal local currency units was converted to nominal US dollars using the relevant exchange rates. This was added to the nominal dollar values of livestock and treestocks, resulting in total nominal agricultural capital. Finally, US GDP deflators were used to convert the data into 1990 US dollars. All deflators and exchange rates used in the project are included with the investment and capital series.

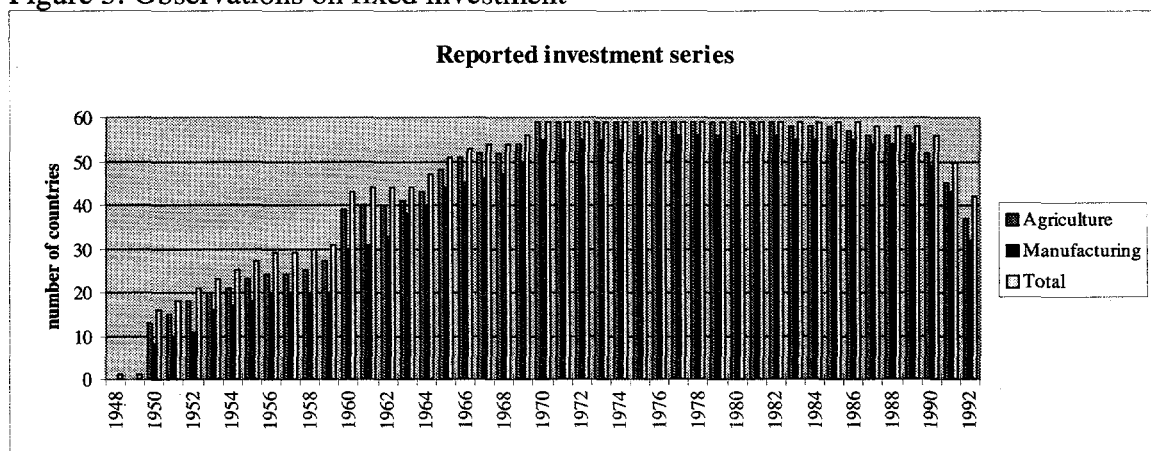
COUNTRY AND TIME COVERAGE

The following countries are included in the investment data set: Argentina, Australia, Austria, Belgium-Luxembourg, Canada, Chile, China, Colombia, Costa Rica, Czechoslovakia (former), Cyprus, Denmark, Dominican Republic, Egypt, El Salvador, Finland, France, Greece, Guatemala, Honduras, Indonesia, India, Ireland, Iran, Iraq, Iceland, Israel, Italy, Jamaica, Japan, Kenya, Morocco, Madagascar, Malta, Mauritius, Malawi, Netherlands, Norway, New Zealand, Pakistan, Peru, Philippines, Poland, Portugal, South Africa, South Korea, Sri Lanka, Sweden, Syria, Trinidad & Tobago,

Tunisia, Turkey, Taiwan, Tanzania, Uruguay, United Kingdom, United States, Venezuela, West Germany (former), and Zimbabwe.

Observations on fixed investment vary from year to year and series to series. The investment series from Argentina begins in 1948 -- although most series begin in the 1960s. Figure 3 provides a frequency count for the fixed investment components. All series on livestock and orchards begin in 1961 and end in 1992.

Figure 3: Observations on fixed investment



The number of corresponding capital series that are estimated varies by sector and subsector. For most of the countries, the data were deemed sufficiently complete to estimate capital stocks for 1967 to 1992. The number of series is summarized in Table 2.

Table 2: Number of countries included in capital stock estimates, by period.

	1967-69	1970-92
Agriculture	56	57
Tree stocks	52	52
Livestock	57	57
Agricultural fixed capital	56	57
Manufacturing	53	55
Total fixed capital	56	57

CONCLUSION

This paper reports time series on fixed investment data and related data on deflators and exchange rates for a large number of countries. A common method is applied to derive sector-level capital stock estimates for fifty-five countries. Still, numerous sources of error are possible and indeed likely. Definitions of fixed investment, agriculture, and manufacturing differ from country to country and possibly within countries over time. Reporting errors are likely as well. Still, the database fills a long-standing need for a sectoral measure of one of the basic components of economic production and a key determinant of the process of growth. Moreover, we show elsewhere (Mundlak, Larson and Butzer, 1997b) that the resulting capital stocks are robust to alternative methods of calculation. At the same time, we hope and expect that further research can extend and improve upon our initial work.

***Annex I: Sources of Agricultural, Manufacturing and Total Fixed Investment
Data, Organized by Country***

ARGENTINA

Agricultural Investment

- 1913-79: Mundlak, Yair, Domingo Cavallo and Roberto Domenech, *Agriculture and Economic Growth in Argentina, 1913-84*, International Food Policy Research Institute, Research Report 76, 1989.
- 1980-92: Direct correspondence of Yair Mundlak with Domingo Cavallo.

Total Investment

- 1913-84: Mundlak, Yair, Domingo Cavallo and Roberto Domenech, *Agriculture and Economic Growth in Argentina, 1913-84*, International Food Policy Research Institute, Research Report 76, 1989.
- 1985-92: International Financial Statistics, International Monetary Fund.

Deflator

- 1960-92: GDP Deflator from the International Financial Statistics, International Monetary Fund.

AUSTRALIA

Agricultural Investment

- 1950-92: Direct correspondence with Eldon Ball (USDA-ERS).

Manufacturing Investment

- 1950: *Yearbook of National Accounts Statistics, 1964*, United Nations.
- 1951-52: Norton, W.E. *Australian Economic Statistics, 1949-50 to 1982-83: I Tables*. Reserve Bank of Australia Occasional Paper No. 8A, 1984. Data reported as new fixed capital expenditures by private enterprises.
- 1953-59: *Australian National Accounts, National Income and Expenditure, 1953-54 to 1965-1966*, Commonwealth Bureau of Census and Statistics.
- 1960-62: *National Accounts Statistics, 1960-71*, OECD.
- 1963: *Yearbook of National Accounts Statistics, 1975*, United Nations.
- 1964-72: *National Accounts of OECD Countries, 1975*, OECD.
- 1973-85: Industrial Statistics, United Nations Industrial Development Organization.
- 1986-88: *Australian Economic Indicators, February 1991*, Australian Bureau of Statistics. Data reported as private new capital expenditures.
- 1989-92: *Australian Economic Indicators, December 1993*, Australian Bureau of Statistics. Data reported as private new capital expenditures.

Total Investment

- 1950-59: *Official Year Book of the Commonwealth of Australia, No. 56, 1970*, Commonwealth Bureau of Census and Statistics.
- 1960-92: World Bank National Accounts.

Deflator

- 1960-92: GDP deflator from World Bank National Accounts.

AUSTRIA

Agricultural Investment

1970-79: *National Accounts, 1970-1982, OECD.*

1980-92: *National Accounts, 1980-1992, OECD.*

Manufacturing Investment

1970-72: *National Accounts, 1970-1982, OECD.*

1973-80: *National Accounts, 1973-1985, OECD.*

1981-91: *National Accounts, 1981-1993, OECD.*

Total Investment

1950-92: *National Accounts, International Financial Statistics, International Monetary Fund.*

Deflators

Agricultural

1950-92: *GDP Deflator from World Bank National Accounts.*

Total

1960-92: *World Bank National Accounts.*

BELGIUM

Agricultural Investment and Total Investment

1953-59: *Statistics of National Accounts, 1950-1961, OECD.*

1960-69: *National Accounts of OECD Countries, 1960-1971, OECD.*

1970-79: *National Accounts, 1970-1982, OECD.*

1980-92: *National Accounts, 1980-1992, OECD.*

Manufacturing Investment

1953-54: *Bulletin d'information et de documentation, 1964, Banque Nationale de Belgique.*

1955-62: *Yearbook of National Accounts Statistics, 1966, United Nations.*

1963-69: *National Accounts Statistics, 1960-71, OECD.*

1970-74: *United Nations National Accounts.*

1975-80: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1985, United Nations.*

1981-92: *National Accounts, 1981-1993, OECD.*

Deflator

Agricultural Investment and Total Investment

1953-59: *Statistics of National Accounts, 1950-1961, OECD.*

1960-69: *National Accounts of OECD Countries, 1960-1971, OECD.*

1970-79: *National Accounts, 1970-1982, OECD.*

1980-92: *National Accounts, 1980-1992, OECD.*

CANADA

Agricultural Investment

1950-60: *Statistics of National Accounts, 1950-1961, OECD.*

1961-69: *National Accounts of OECD Countries, 1960-1971, OECD.*

1970-79: *National Accounts, 1970-1982, OECD.*

1980-92: *National Accounts, 1980-1992, OECD.*

Manufacturing Investment

- 1948: *The Growth of World Industry, 1938-1961, National Tables*, United Nations.
- 1949: Interpolation.
- 1950-54: *Yearbook of National Accounts Statistics, 1957*, United Nations.
- 1955-59: *Yearbook of National Accounts Statistics, 1966*, United Nations.
- 1960-69: *National Accounts Statistics, 1960-1971*, OECD.
- 1970-80: *National Accounts, 1970-1982*, OECD.
- 1981-92: *National Accounts, 1981-1993*, OECD.

Total Investment

- 1950-78: *Fixed Capital Flows and Stocks, 1926-1978*, Statistics Canada.
- 1979: *National Accounts, 1970-1982*, OECD.
- 1980-92: *National Accounts, 1980-1992*, OECD.

Deflators

Agricultural

- 1950-92: Direct correspondence with Eldon Ball (USDA-ERS).

Total

- 1950-59: GDP Deflator from International Financial Statistics, International Monetary Fund.
- 1960-92: GDP Deflator from World Bank National Accounts.

CHILE

Agricultural Investment and Manufacturing Investment

- 1961-82: Coeymans, Juan Eduardo, and Yair Mundlak, *Sectoral Growth in Chile: 1962-82*, International Food Policy Research Institute, Research Report 95, 1993.

Total Investment

- 1961-82: Coeymans, Juan Eduardo, and Yair Mundlak, *Sectoral Growth in Chile: 1962-82*, International Food Policy Research Institute, Research Report 95, 1993.
- 1983-92: World Bank National Accounts.

Deflator

- 1960-92: GDP Deflator from the International Financial Statistics, International Monetary Fund.

COLOMBIA

Agricultural Investment and Total Investment

- 1965-69: *Cuentas Nacionales de Colombia, 1965-1986*, Departamento Administrativa Nacional de Estadísticas.
- 1970-87: *Cuentas Nacionales de Colombia, 1970-1988*, Departamento Administrativa Nacional de Estadísticas.
- 1988-90: *Cuentas Nacionales de Colombia, 1970-1991*, Departamento Administrativa Nacional de Estadísticas.

Manufacturing Investment

1963-84 & 1986: Industrial Statistics, United Nations Industrial Development Organization.

1985 & 1989-91: *International Yearbook of Industrial Statistics, 1995*, United Nations Industrial Development Organization.

1987-88: *Industrial Statistics Yearbook, 1991*, United Nations.

Deflators

Agricultural Investment and Total Investment

1965-69: *Cuentas Nacionales de Colombia, 1965-1986*, Departamento Administrativa Nacional de Estadísticas.

1970-87: *Cuentas Nacionales de Colombia, 1970-1988*, Departamento Administrativa Nacional de Estadísticas.

1988-90: *Cuentas Nacionales de Colombia, 1970-1991*, Departamento Administrativa Nacional de Estadísticas.

COSTA RICA

Agricultural Investment

1965-72: *Cifras de Cuentas Nacionales de Costa Rica, Serie 1957-1972*, Banco Central de Costa Rica.

1973: *Cifras de Cuentas Nacionales de Costa Rica, Serie 1970-78*, Banco Central de Costa Rica.

1974-82: *Cuentas Nacionales de Costa Rica, Serie 1973-1982*, Banco Central de Costa Rica.

1983-89: *Cuentas Nacionales de Costa Rica*, Banco Central de Costa Rica. Faxed from Costa Rica. Date on publication: September 1992.

1990-91: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1992*, United Nations.

Manufacturing Investment

(mining is included)

1965-69: *Yearbook of National Accounts Statistics, 1975*, United Nations.

1970-79: *Yearbook of National Accounts Statistics, 1980*, United Nations.

1980-84: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1985*, United Nations.

1985-91: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1991*, United Nations.

Total Investment

1960-72: *Cifras de Cuentas Nacionales de Costa Rica, Serie 1957-1972*, Banco Central de Costa Rica.

1973: *Cifras de Cuentas Nacionales de Costa Rica, Serie 1973-82*, Banco Central de Costa Rica.

1974-81: *Cuentas Nacionales de Costa Rica, Serie 1974-83*, Banco Central de Costa Rica.

1982-89: *Cuentas Nacionales de Costa Rica*, Banco Central de Costa Rica. Faxed from Costa Rica. Date on publication: September 1992.

1990-91: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1992*, United Nations.

Deflator

1960-92: GDP Deflator from the International Financial Statistics, International Monetary Fund.

CYPRUS

Agricultural Investment

- 1953-54: *Statistical Abstract, 1956, No. 2*, Statistics Office, Financial Secretary's Office, Republic of Cyprus.
- 1955-62: *Statistical Abstract, 1962, No. 8*, Republic of Cyprus.
- 1963-64: *Statistical Abstract, 1964, No. 10*, Statistics and Research Department, Ministry of Finance, Republic of Cyprus.
- 1965-66: *Statistical Abstract, 1967, No. 13*, Statistics and Research Department, Ministry of Finance, Republic of Cyprus.
- 1967-74: *Yearbook of National Accounts Statistics, 1975*, United Nations.
- 1975-77: *Yearbook of National Accounts Statistics, 1978*, United Nations.
- 1978-81: *Yearbook of National Accounts Statistics, 1982*, United Nations.
- 1982-85: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1991*, United Nations.
- 1986-92: *Bulletin, September 1994, Number 124*, Central Bank of Cyprus.

Manufacturing Investment

- 1963: *The Growth of World Industry, 1971 Edition*, United Nations.
- 1964 & 1966: Interpolation.
- 1965: *Yearbook of National Accounts Statistics, 1978*, United Nations.
- 1967-72: *Yearbook of National Accounts Statistics, 1975*, United Nations.
- 1973-78: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1983*, United Nations.
- 1979-81: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1988*, United Nations.
- 1982-91: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1992*, United Nations.
- 1992: *Industrial Statistics, 1993*, Department of Statistics and Research, Ministry of Finance, Republic of Cyprus.

Total Investment

- 1953-54: *Statistical Abstract, 1956, No. 2*, Statistics Office, Financial Secretary's Office, Republic of Cyprus.
- 1955-62: *Statistical Abstract, 1962, No. 8*, Republic of Cyprus.
- 1963-64: *Statistical Abstract, 1964, No. 10*, Statistics and Research Department, Ministry of Finance, Republic of Cyprus.
- 1965-66: *Statistical Abstract, 1967, No. 13*, Statistics and Research Department, Ministry of Finance, Republic of Cyprus.
- 1967-72: *Yearbook of National Accounts Statistics, 1975*, United Nations.
- 1973-79: *Yearbook of National Accounts Statistics, 1982*, United Nations.

1980-85: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1991*, United Nations.

1986-92: *Bulletin, September 1994, Number 124* Central Bank of Cyprus.

Deflators

1950-57: GDP Deflator from the International Financial Statistics, International Monetary Fund.

1958-59: *Statistical Abstract, 1963, No. 9*, Statistics and Research Department, Ministry of Finance, Republic of Cyprus.

1960-74: United Nations National Accounts.

1975-92: World Bank National Accounts.

CZECHOSLOVAKIA (FORMER)

Agricultural Investment and Total Investment

1960-62: *Yearbook of National Accounts Statistics, 1967*, United Nations.

1963-69: *Yearbook of National Accounts Statistics, 1972*, United Nations.

1970-79: *Yearbook of National Accounts Statistics, 1980*, United Nations.

1980-90: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1991*, United Nations.

Manufacturing Investment

(mining and electricity are included)

1953 & 1955-59: *Yearbook of National Accounts Statistics, 1966*, United Nations.

1954: Interpolation.

1960-69: *Yearbook of National Accounts Statistics, 1971*, United Nations.

1970-74: *Yearbook of National Accounts Statistics, 1980*, United Nations.

1975-81: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1985*, United Nations.

1982-90: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1992*, United Nations.

Deflators

Agricultural Investment and Total Investment

1960-62: *Yearbook of National Accounts Statistics, 1967*, United Nations.

1963-69: *Yearbook of National Accounts Statistics, 1972*, United Nations.

1970-79: *Yearbook of National Accounts Statistics, 1980*, United Nations.

1980-90: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1991*, United Nations.

DENMARK

Agricultural Investment and Total Investment

1950-59: *Statistics of National Accounts, 1950-1961*, OECD.

1960-69: *National Accounts of OECD Countries, 1960-1971*, OECD.

1970-79: *National Accounts, 1970-1982*, OECD.

1980-92: *National Accounts, 1980-1992*, OECD.

Manufacturing Investment

- 1948: *The Growth of World Industry, 1938-1961, National Tables*, United Nations.
- 1949: Interpolation.
- 1950-59: *Statistics of National Accounts, 1950-1961*, OECD.
- 1960-69: *National Accounts Statistics, 1960-1971*, OECD.
- 1970: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1985*, United Nations.
- 1971-72: United Nations National Accounts.
- 1973-80: *National Accounts, 1973-1985*, OECD.
- 1981-92: *National Accounts, 1981-1993*, OECD.

Deflators

Agricultural Investment and Total Investment

- 1950-59: *Statistics of National Accounts, 1950-1961*, OECD.
- 1960-69: *National Accounts of OECD Countries, 1960-1971*, OECD.
- 1970-79: *National Accounts, 1970-1982*, OECD.
- 1980-92: *National Accounts, 1980-1992*, OECD.

DOMINICAN REPUBLIC

Agricultural Investment

- 1950-59: *Cuentas Nacionales de la Republica Dominicana, Producto Bruto Nacional, 1950-1964*, Banco Central de la Republica Dominicana.
- 1960-69: *Cuentas Nacionales, Producto Nacional Bruto, 1960-1971*, Banco Central de la Republica Dominicana.
- 1970-74: *Cuentas Nacionales, Producto Nacional Bruto, 1970-1976*, Banco Central de la Republica Dominicana.
- 1975-79: *Cuentas Nacionales, Producto Nacional Bruto, 1975-1979*, Banco Central de la Republica Dominicana.
- 1980-89: *Cuentas Nacionales e Investigacion Economica*, Fax from Lic. Olga Diaz Mora, Banco Central de la Republica Dominicana.

Total Investment

- 1950-59: *Cuentas Nacionales de la Republica Dominicana, Producto Bruto Nacional, 1950-1964*, Banco Central de la Republica Dominicana.
- 1960-67: *Cuentas Nacionales de la Republica Dominicana, Producto Nacional Bruto, 1960-1971*, Banco Central de la Republica Dominicana.
- 1968-69: *Cuentas Nacionales de la Republica Dominicana, Producto Nacional Bruto, 1968-1973*, Banco Central de la Republica Dominicana.
- 1970-74: *Cuentas Nacionales de la Republica Dominicana, Producto Nacional Bruto, 1970-1976*, Banco Central de la Republica Dominicana.
- 1975-79: *Cuentas Nacionales de la Republica Dominicana, Producto Nacional Bruto, 1975-1979*, Banco Central de la Republica Dominicana.
- 1980-92: *Cuentas Nacionales e Investigacion Economica*, Fax from Lic. Olga Diaz Mora, Banco Central de la Republica Dominicana.

Deflator

- 1960-92: GDP Deflator from World Bank National Accounts.

ECUADOR

Manufacturing Investment

- 1962: *Encuesta Industrial, 1962-64*, Junta Nacional de Planificacion y Coordinacion, Ecuador.
- 1963-90: Industrial Statistics, United Nations Industrial Development Organization.
- 1991: *Encuesta Anual de Manufactura y Minería, Tomo 1, 1991*, Instituto Nacional de Estadística y Censos.

EGYPT

Agricultural Investment and Total Investment

- 1960-65: *Statistical Yearbook, Arab Republic of Egypt, 1965*.
- 1966-70: *Statistical Yearbook, Arab Republic of Egypt, 1971*.
- 1971: *Statistical Yearbook, Arab Republic of Egypt, 1973*.
- 1972-76: *Economic Bulletin, 1979*, National Bank of Egypt.
- 1977-82: *Economic Bulletin, 1984*, National Bank of Egypt.
- 1983-91: *Economic Bulletin, 1993*, National Bank of Egypt.

Manufacturing Investment

- 1967-68: Industrial Statistics, United Nations Industrial Development Organization.
- 1969-71: *Yearbook of National Accounts Statistics, 1975*, United Nations.
- 1972-74: *Yearbook of National Accounts Statistics, 1980*, United Nations.
- 1975-79: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1985*, United Nations.
- 1980-86: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1991*, United Nations.
- 1987-89: *International Yearbook of Industrial Statistics, 1995*, United Nations Industrial Development Organization.

Deflator

- 1960-92: GDP Deflator from World Bank National Accounts.

EL SALVADOR

Agricultural Investment

- 1965-72: *Yearbook of National Accounts Statistics, 1975*, United Nations.
- 1973-75: *Yearbook of National Accounts Statistics, 1978*, United Nations.
- 1976-80: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1986*, United Nations.
- 1981-87: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1991*, United Nations.
- 1988-92: *Revista Trimestral, October-November-December 1993*, Banco Central de Reserva de El Salvador.

Manufacturing Investment

(mining is included)

- 1958-59, 1961-62 & 1964: *Yearbook of National Accounts Statistics, 1966*, United Nations.
1960 & 1966: *Yearbook of National Accounts Statistics, 1975*, United Nations.
1963, 1965 & 1967-72: *Yearbook of National Accounts Statistics, 1976*, United Nations.
1973-75: *United Nations National Accounts*.
1976: *Revista Mensual, January 1982*, Banco Central de Reserva de El Salvador.
1977-80: *Revista del Banco Central de Reserva de El Salvador, January-February-March 1984*, Banco Central de Reserva de El Salvador.
1981-87: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1991*, United Nations.
1988-92: *Revista Trimestral, October-November-December 1993*, Banco Central de Reserva de El Salvador.

Total Investment

- 1965-72: *Yearbook of National Accounts Statistics, 1975*, United Nations.
1973-74: *Yearbook of National Accounts Statistics, 1978*, United Nations.
1975-79: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1986*, United Nations.
1980-87: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1991*, United Nations.
1988-92: *Revista Trimestral, October-November-December 1993*, Banco Central de Reserva de El Salvador.

Deflator

- 1960-92: GDP Deflator from World Bank National Accounts.

FINLAND

Agricultural Investment and Total Investment

- 1960-69: *National Accounts of OECD Countries, 1960-1971*, OECD.
1970-79: *National Accounts, 1970-1982*, OECD.
1980-92: *National Accounts, 1980-1992*, OECD.

Manufacturing Investment

- 1948, 1950, 1960 & 1962-69: *Suomen tilastollinen vuosikirja: Statistical yearbook of Finland, 1978*, Central Statistical Office of Finland.
1949, 1951-52 & 1954: Interpolation.
1953, 1955-59 & 1961: *Yearbook of National Accounts Statistics, 1966*, United Nations.
1970-79: *National Accounts, 1970-1982*, OECD.
1980: *National Accounts, 1980-1992*, OECD.
1981-92: *National Accounts, 1981-1993*, OECD.

Deflator

Agricultural Investment and Total Investment

- 1960-69: *National Accounts of OECD Countries, 1960-1971*, OECD.

1970-79: *National Accounts, 1970-1982*, OECD.

1980-92: *National Accounts, 1980-1992*, OECD.

FRANCE

Agricultural Investment and Total Investment

1960-69: *National Accounts of OECD Countries, 1960-1971*, OECD.

1970-79: *National Accounts, 1970-1982*, OECD.

1980-92: *National Accounts, 1980-1992*, OECD.

Manufacturing Investment

1963-78: *Industrial Statistics, United Nations Industrial Development Organization.*

1979-80: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1988*, United Nations.

1981-92: *National Accounts, 1981-1993*, OECD.

Deflators

Agricultural Investment and Total Investment

1960-69: *National Accounts of OECD Countries, 1960-1971*, OECD.

1970-79: *National Accounts, 1970-1982*, OECD.

1980-92: *National Accounts, 1980-1992*, OECD.

GERMANY (FORMER WEST GERMANY)

Agricultural Investment and Total Investment

1950-59: *Statistics of National Accounts, 1950-1961*, OECD.

1960-69: *National Accounts, 1960-1971*, OECD.

1970-79: *National Accounts, 1970-1982*, OECD.

1980-92: *National Accounts, 1980-1992*, OECD.

Manufacturing Investment

1960-63: *National Accounts ESA: Detailed Tables by Branches 1970-1978. Section II: Structural Data Base, 1960-1978*, Eurostat, Statistical Office of the European Communities.

1964-69: *Industrial Statistics, United Nations Industrial Development Organization.*

1970-72: *National Accounts, 1970-1982*, OECD.

1973-79: *National Accounts, 1973-1985*, OECD.

1980: *National Accounts, 1980-1992*, OECD.

1981-92: *National Accounts, 1981-1993*, OECD.

Deflators

Agricultural Investment and Total Investment

1950-59: *Statistics of National Accounts, 1950-1961*, OECD.

1960-69: *National Accounts, 1960-1971*, OECD.

1970-79: *National Accounts, 1970-1982*, OECD.

1980-92: *National Accounts, 1980-1992*, OECD.

GREECE

Agricultural Investment and Total Investment

- 1950-59: *Statistics of National Accounts, 1950-1961*, OECD.
- 1960-69: *National Accounts of OECD Countries, 1960-1971*, OECD.
- 1970-79: *National Accounts, 1970-1982*, OECD.
- 1980-81: *National Accounts, 1980-1992*, OECD.
- 1982-92: *National Accounts, 1981-1993*, OECD.

Manufacturing Investment

- 1948: *The Growth of World Industry, 1938-1961, National Tables*, United Nations.
- 1949: Interpolation.
- 1950-55: *Yearbook of National Accounts Statistics, 1957*, United Nations.
- 1956-59: *Yearbook of National Accounts Statistics, 1966*, United Nations.
- 1960-68: *National Accounts Statistics, 1960-1971*, OECD.
- 1969-72: *Yearbook of National Accounts Statistics, 1978*, United Nations.
- 1973-80: *National Accounts, 1973-1985*, OECD.
- 1981-92: *National Accounts, 1981-1993*, OECD.

Deflators

Agricultural Investment and Total Investment

- 1950-59: *Statistics of National Accounts, 1950-1961*, OECD.
- 1960-69: *National Accounts of OECD Countries, 1960-1971*, OECD.
- 1970-79: *National Accounts, 1970-1982*, OECD.
- 1980-81: *National Accounts, 1980-1992*, OECD.
- 1982-92: *National Accounts, 1981-1993*, OECD.

GUATEMALA

Agricultural Investment

- 1958-64: *Cuentas Nacionales de Guatemala, 1968*, Departamento de Estudios Economicas.
- 1965-78: *Estadisticas de los Cuentas Nacionales de Guatemala, 1965-1979*, Banco de Guatemala.
- 1979-86: *Boletin Estadistico*, Fax from Roberto Rosenberg of the Embassy of Guatemala, July 14, 1988.
- 1987: *Boletin Estadistico*, Banco de Guatemala, Fax from Roberto Rosenberg of the Embassy of Guatemala, July 14, 1988, and *Boletin Estadistico, January-September 1991*, Banco de Guatemala.
- 1988-89: *Boletin Estadistico, January-September 1991*, Banco de Guatemala.
- 1990-92: *Boletin Estadistico, January-February-March 1994*, Banco de Guatemala.

Manufacturing Investment

(mining is included)

- 1960, 1963 & 1965-74: *Yearbook of National Accounts Statistics, 1975*, United Nations.
- 1961-62 & 1964: Interpolation.

- 1975-81: *National Accounts Statistics: Main Aggregates and Detailed Tables*, 1985, United Nations.
1982-92: *National Accounts Statistics: Main Aggregates and Detailed Tables*, 1992, United Nations.

Total Investment

- 1958-64: *Cuentas Nacionales de Guatemala, 1968*, Departamento de Estudios Economicas.
1965-78: *Estadisticas de los Cuentas Nacionales de Guatemala, 1965-1979*, Banco de Guatemala.
1979: *Boletin Estadistico*, Banco de Guatemala, Fax from Roberto Rosenberg of the Embassy of Guatemala, July 14, 1988.
1980-89: *Boletin Estadistico, January-September 1991*, Banco de Guatemala.
1990-92: *Boletin Estadistico, January-February-March 1994*, Banco de Guatemala.

Deflator

- 1950-92: GDP Deflator from the International Financial Statistics, International Monetary Fund.

HONDURAS

Agricultural Investment and Total Investment

- 1960-75: *Cuentas Nacionales de Honduras, 1960-1975*, Banco Central de Honduras.
1976-77: *National Accounts Statistics: Main Aggregates and Detailed Tables*, 1984, United Nations.
1978-90: *Cuentas Nacionales de Honduras, 1978-1990*, Banco Central de Honduras.

Deflator

- 1950-92: GDP Deflator from the International Financial Statistics, International Monetary Fund.

ICELAND

Agricultural Investment and Total Investment

- 1950-59: *Statistics of National Accounts, 1950-1961*, OECD.
1960-69: *National Accounts of OECD Countries, 1960-1971*, OECD.
1970-79: *National Accounts, 1970-1982*, OECD.
1980-92: *National Accounts, 1980-1992*, OECD.

Manufacturing Investment

(mining is included)

- 1948 & 1950-54: *The Growth of World Industry, 1938-1961, National Tables*, United Nations.
1949: Interpolation.
1955-59: *Yearbook of National Accounts Statistics, 1964*, United Nations.
1960-70: *National Accounts Statistics, 1960-1971*, OECD.
1971-77: *National Accounts, 1970-1982*, OECD.

1978-80: *National Accounts, 1973-1985*, OECD.

1981-92: *National Accounts, 1981-1993*, OECD.

Deflators

Agricultural Investment and Total Investment

1950-59: *Statistics of National Accounts, 1950-1961*, OECD.

1960-69: *National Accounts of OECD Countries, 1960-1971*, OECD.

1970-79: *National Accounts, 1970-1982*, OECD.

1980-92: *National Accounts, 1980-1992*, OECD.

INDIA

Agricultural Investment and Total Investment

1951-80: *National Accounts Statistics, New Series, 1989: 1950-51 - 1979-80*, Central Statistical Organization, Department of Statistics, Ministry of Planning, Government of India.

1981-84: *National Accounts Statistics, New Series, 1989: 1980-81 - 1986-87*, Central Statistical Organization, Department of Statistics, Ministry of Planning, Government of India.

1985-88: *National Accounts Statistics, 1992*, Central Statistical Organization, Department of Statistics, Ministry of Planning and Program Implementation, Government of India.

1989-92: *National Accounts Statistics, 1993*, Central Statistical Organization, Department of Statistics, Ministry of Planning and Program Implementation, Government of India.

Manufacturing Investment

1950-79: *National Accounts Statistics, New Series, 1989: 1950-51 - 1979-80*, Central Statistical Organization, Department of Statistics, Ministry of Planning, Government of India.

1980-91: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1991*, United Nations.

Deflators

GDP Deflator computed from:

1951-80: *National Accounts Statistics, New Series, 1989: 1950-51 - 1979-80*, Central Statistical Organization, Department of Statistics, Ministry of Planning, Government of India.

1981-84: *National Accounts Statistics, New Series, 1989: 1980-81 - 1986-87*, Central Statistical Organization, Department of Statistics, Ministry of Planning, Government of India.

1985-88: *National Accounts Statistics, 1992*, Central Statistical Organization, Department of Statistics, Ministry of Planning and Program Implementation, Government of India.

1989-92: *National Accounts Statistics, 1993*, Central Statistical Organization, Department of Statistics, Ministry of Planning and Program Implementation, Government of India.

INDONESIA

Agricultural Investment

Domestic Component

- 1970-74: *Statistik Indonesia, 1975*, Central Bureau of Statistics, Indonesia.
- 1975-78: Interpolation.
- 1979-80: *Statistik Indonesia, 1980/1981*, Central Bureau of Statistics, Indonesia.
- 1981-82: *Statistik Indonesia, 1983*, Central Bureau of Statistics, Indonesia.
- 1983-84: *Statistik Indonesia, 1985*, Central Bureau of Statistics, Indonesia.
- 1985-88: *Indonesian Financial Statistics, Jan.-May 1990*, Bank Indonesia.
- 1989-92: *Indonesian Financial Statistics, August 1990*, Bank Indonesia.

Foreign Component

- 1970-74: *Statistik Indonesia, 1975*, Central Bureau of Statistics, Indonesia.
- 1975-78: Interpolation.
- 1979-81: *Indonesian Financial Statistics, December 1985*, Bank Indonesia.
- 1982-84: *Indonesian Financial Statistics, September 1989*, Bank Indonesia.
- 1985-88: *Indonesian Financial Statistics, Jan.-May 1990*, Bank Indonesia.
- 1989-92: *Indonesian Financial Statistics, August 1994*, Bank Indonesia.

Manufacturing Investment

- 1970-73 & 1975-89: Industrial Statistics, United Nations Industrial Development Organization.
- 1974: Interpolation.
- 1990-91: *Statistik Indonesia (Statistical Yearbook of Indonesia), 1993*, Biro Pusat Statistik, Jakarta, Indonesia.

Total Investment

- 1960-92: World Bank National Accounts.

Deflator

- 1960-92: GDP Deflator from National Accounts.

IRAN

Agricultural Investment and Total Investment

- 1965-68: *National Income of Iran, 1959-1972*, Bureau of National Accounts, Bank Markazi Iran.
- 1969 & 1971: *Yearbook of National Accounts Statistics, 1978*, United Nations.
- 1970 & 1972-79: *Yearbook of National Accounts Statistics, 1982*, United Nations.
- 1980-90: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1991*, United Nations.

Manufacturing Investment

(mining is included)

- 1965-68: *National Income of Iran, 1959-1972*, Bureau of National Accounts, Bank Markazi Iran.
- 1969-72: *Yearbook of National Accounts Statistics, 1978*, United Nations.
- 1973-79: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1983*, United Nations.

1980-90: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1991*, United Nations.

Deflator

1960-73 GDP Deflator from United Nations National Accounts.

1974-92: GDP Deflator from World Bank National Accounts.

IRAQ

Agricultural Investment

1960-62: *Yearbook of National Accounts Statistics, 1969*, United Nations.

1963, 1965 & 1969-74: *Yearbook of National Accounts Statistics, 1978*, United Nations.

1964 & 1966-68: *Yearbook of National Accounts Statistics, 1971*, United Nations.

1975-84: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1985*, United Nations.

1985-89: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1991*, United Nations.

Manufacturing Investment

1953, 1955, 1958 & 1960-68: *Yearbook of National Accounts Statistics, 1969*, United Nations.

1954, 1956-57 & 1959: Interpolation.

1969-74: *Yearbook of National Accounts Statistics, 1978*, United Nations.

1975-81: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1985*, United Nations.

1982-91: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1991*, United Nations.

Total Investment

1960-62: *Yearbook of National Accounts Statistics, 1969*, United Nations.

1963, 1965 & 1969-73: *Yearbook of National Accounts Statistics, 1978*, United Nations.

1964 & 1966-68: *Yearbook of National Accounts Statistics, 1971*, United Nations.

1974: *Yearbook of National Accounts Statistics, 1982*, United Nations.

1975-84: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1985*, United Nations.

1985-89: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1991*, United Nations.

Deflator

1960-90: GDP Deflator from World Bank National Accounts.

IRELAND

Agricultural Investment and Total Investment

1950-59: *Statistics of National Accounts, 1950-1961*, OECD.

1960-69: *National Accounts of OECD Countries, 1960-1971*, OECD.

- 1970-81: *National Accounts, 1970-1982*, OECD.
- 1982-85: *National Accounts, 1979-1991*, OECD.
- 1986-92: *National Accounts, 1980-1992*, OECD.

Manufacturing Investment

- 1948 & 1951-52: *The Growth of World Industry, 1938-1961, National Tables*, United Nations.
- 1949: Interpolation.
- 1950, 1953 & 1955-59: *Yearbook of National Accounts Statistics, 1964*, United Nations.
- 1954: *Yearbook of National Accounts Statistics, 1960*, United Nations.
- 1960-64: *National Accounts Statistics, 1960-1971*, OECD.
- 1965-69: *Yearbook of National Accounts Statistics, 1975*, United Nations.
- 1970-72: *National Accounts, 1970-1982*, OECD.
- 1973-79: *National Accounts, 1973-1985*, OECD.
- 1980-85: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1991*, United Nations.
- 1986-92: *National Accounts, 1981-1993*, OECD.

Deflators

Agricultural Investment and Total Investment

- 1950-59: *Statistics of National Accounts, 1950-1961*, OECD.
- 1960-69: *National Accounts of OECD Countries, 1960-1971*, OECD.
- 1970-81: *National Accounts, 1970-1982*, OECD.
- 1982-85: *National Accounts, 1979-1991*, OECD.
- 1986-92: *National Accounts, 1980-1992*, OECD.

ISRAEL

Agricultural Investment and Total Investment

- 1952-68: *Statistical Abstract of Israel, 1970*, Central Bureau of Statistics.
- 1969-70: *Statistical Abstract of Israel, 1971-72*, Central Bureau of Statistics.
- 1971-74: *Statistical Abstract of Israel, 1980*, Central Bureau of Statistics.
- 1975-79: *Statistical Abstract of Israel, 1984*, Central Bureau of Statistics.
- 1980-89: *Statistical Abstract of Israel, 1991*, Central Bureau of Statistics.
- 1990-92: *Statistical Abstract of Israel, 1993*, Central Bureau of Statistics.

Manufacturing Investment

(mining is included)

- 1962-68: *Statistical Abstract of Israel, 1970*, Central Bureau of Statistics.
- 1969-72: *Yearbook of National Accounts Statistics, 1975*, United Nations.
- 1973-74: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1983*, United Nations.
- 1975-82: *Statistical Abstract of Israel, 1984*, Central Bureau of Statistics.
- 1983-92: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1992*, United Nations.

Deflator

- 1950-59: GDP Deflator from World Bank National Accounts and United Nations National Accounts.

1960-92: GDP Deflator from World Bank National Accounts.

ITALY

Agricultural Investment and Total Investment

- 1950-59: *Statistics of National Accounts, 1950-1961*, OECD.
- 1960-69: *National Accounts of OECD Countries, 1960-1971*, OECD.
- 1970-79: *National Accounts, 1970-1982*, OECD.
- 1980-92: *National Accounts, 1980-1992*, OECD.

Manufacturing Investment

(mining is included)

- 1960-69: *National Accounts ESA: Detailed Tables by Branches 1970-1978. Section II: Structural Data Base, 1960-1978*, Eurostat, Statistical Office of the European Communities.
- 1970-79: *National Accounts, 1970-1982*, OECD.
- 1980-90: *National Accounts, 1980-1992*, OECD.

Deflators

Agricultural Investment and Total Investment

- 1950-59: *Statistics of National Accounts, 1950-1961*, OECD.
- 1960-69: *National Accounts of OECD Countries, 1960-1971*, OECD.
- 1970-79: *National Accounts, 1970-1982*, OECD.
- 1980-92: *National Accounts, 1980-1992*, OECD.

JAMAICA

Agricultural Investment and Total Investment

- 1952-68: *National Income and Product, 1968*, Department of Statistics, Jamaica.
- 1969-73: *National Income and Product, 1974*, Department of Statistics, Jamaica.
- 1974-80: *National Income and Product, 1981*, Department of Statistics, Jamaica.
- 1981-88: *National Income and Product, 1989*, Statistical Institute of Jamaica.
- 1989-92: *National Income and Product, 1992*, Statistical Institute of Jamaica via Eliza Winters of the World Bank.

Manufacturing Investment

(For 1956-74, the series used is fixed capital formation in manufacturing. For 1975-92, the series used is fixed capital formation as industrial machinery and equipment. The correlation for the 12-year overlap of these series is 0.94.)

- 1956-58: *Yearbook of National Accounts Statistics, 1966*, United Nations.
- 1959-68: *National Income and Product, 1968*, Department of Statistics, Jamaica.
- 1969-74: *National Income and Product, 1974*, Department of Statistics, Jamaica.
- 1975-80: *National Income and Product, 1981*, Department of Statistics, Jamaica.

- 1981-88: *National Income and Product, 1989*, Statistical Institute of Jamaica.
 1989-92: *National Income and Product, 1992*, Statistical Institute of Jamaica.

Deflator

- 1956-92: GDP Deflator from Mrs. Annette McKenzie, Director of Economic Accounting, Statistical Institute of Jamaica.

JAPAN

Agricultural Investment

- 1952-62: *Annual Report on National Income Statistics, 1968*, Economic Planning Agency, Government of Japan.
 1963-69: *Annual Report on National Income Statistics, 1972*, Economic Planning Agency, Government of Japan.
 1970-76: *Yearbook of National Accounts Statistics, 1979*, United Nations.
 1977: Agrstat Agricultural Accounts via Eldon Ball (of the USDA), OECD.
 1978-79: *Economic Accounts for Agriculture, 1978-1991*, OECD.
 1980-92: Agrstat Agricultural Accounts via Eldon Ball (of the USDA), OECD.

Manufacturing Investment

- 1951-66: *Revised Report on National Income Statistics, 1951-1967*, Economic Planning Agency, Government of Japan.
 1967-75: *National Accounts of OECD Countries, 1975*, OECD.
 1976: *Yearbook of National Accounts Statistics, 1978*, United Nations.
 1977-84 & 1986-89: Industrial Statistics, United Nations Industrial Development Organization.
 1985 & 1990-92: *International Yearbook of Industrial Statistics, 1995*, United Nations Industrial Development Organization.

Total Investment

- 1952-62: *Annual Report on National Income Statistics, 1968*, Economic Planning Agency, Government of Japan.
 1963-69: *Annual Report on National Income Statistics, 1972*, Economic Planning Agency, Government of Japan.
 1970-86: *Report on the Revised National Accounts on the Basis of 1985*, Tables faxed from Iomoaki Ohara of the Department of National Accounts in the Economic Research Institute of the Economic Planning Agency, Government of Japan.
 1987-90: *Annual Report on National Accounts, 1993*, Economic Planning Agency, Government of Japan.
 1991-92: *Report on the Revised National Accounts on the Basis of 1985*, Tables faxed from Iomoaki Ohara of the Department of National Accounts in the Economic Research Institute of the Economic Planning Agency, Government of Japan.

Deflators

- 1952-59: GDP Deflator from National Accounts of the International Financial Statistics of the IMF.
 1960-92: GDP Deflator from World Bank National Accounts.

KENYA

Agricultural Investment

1964-87: Various editions of *Statistical Abstract* by the Statistics Division, Ministry of Economic Planning and Development, Government of Kenya.

<u>Investment Date</u>	<u>Edition of Statistical Abstract</u>
1964-66	1967
1967	1968
1968	1969
1969	1970
1970	1971
1971	1972
1972	1973
1973	1974
1974-76	1977
1977-78	1979
1979-80	1981
1981	1982
1982	1984
1983	1985
1984-85	1986
1986-87	1988
1988-92	Tables from <i>Economic Survey</i> Central Bureau of Statistics Transmitted to World Bank by Kenya Team.

Manufacturing Investment

1964 & 1966-68: *Yearbook of National Accounts Statistics, 1973*, United Nations.

1965 & 1969-71: *Yearbook of National Accounts Statistics, 1978*, United Nations.

1972-78: *Yearbook of National Accounts Statistics, 1980*, United Nations.

1979-88: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1988*, United Nations.

1989-92: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1992*, United Nations.

Total Investment

1964-87: Various editions of *Statistical Abstract* by the Statistics Division, Ministry of Economic Planning and Development, Government of Kenya.

<u>Investment Date</u>	<u>Edition of Statistical Abstract</u>
1964-66	1967
1967-71	1973
1972-74	1977

1975-79	1981
1980-82	1985
1983-92	Tables from <i>Economic Survey</i> . Central Bureau of Statistics Transmitted to World Bank by Kenya Team.

Deflator

1964-92: GDP Deflator from the International Financial Statistics, International Monetary Fund.

LUXEMBOURG

Agricultural Investment and Total Investment

1970-79: *National Accounts, 1970-1982*, OECD.

1980-91: *National Accounts, 1980-1992*, OECD.

Manufacturing Investment

1953 & 1958-59: *The Growth of World Industry, 1967 Edition*, United Nations.

1954-57: Interpolation.

1960-67: *National Accounts Statistics, 1960-1971*, OECD.

1968-69 & 1971-72: *National Accounts of OECD Countries, 1975*, OECD.

1970 & 1975-79: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1985*, United Nations.

1973-74: *National Accounts, 1973-1985*, OECD.

1980-91: *National Accounts, 1980-1992*, OECD.

Deflators

Agricultural Investment and Total Investment

1970-79: *National Accounts, 1970-1982*, OECD.

1980-91: *National Accounts, 1980-1992*, OECD.

MADAGASCAR

Agricultural Investment, Manufacturing Investment and Total Investment

1970-72: *Situation Economique, January 1, 1973*, Direction de l'Institut National de la Statistique et de la Recherche Economique (INSRE).

1973-75: *Situation Economique, January 1, 1976*, INSRE.

1976-77: *Situation Economique, January 1, 1979*, INSRE.

1978-79: *Situation Economique, January 1, 1981*, INSRE.

1980-81: *Situation Economique, January 1, 1982*, INSRE.

1982: *Situation Economique, January 1, 1983*, INSRE.

1983-84: *Situation Economique, January 1, 1985*, INSRE.

1985: *Situation Economique, January 1, 1986*, INSRE.

1986-89: *Situation Economique, January 1, 1990*, INSRE.

1990-91: *Situation Economique, January 1, 1992*, INSRE.

Deflator

1961-92: GDP Deflator from the International Financial Statistics of the IMF.

MALAWI

Agricultural Investment and Total Investment

- 1964-72: *Malawi Statistical Yearbook, 1976*, National Statistical Office.
- 1973-79: *Malawi Statistical Yearbook, 1982*, National Statistical Office.
- 1980-86: *Malawi Statistical Yearbook, 1988*, National Statistical Office.

Manufacturing Investment

(mining is included)

- 1955-63: *Yearbook of National Accounts Statistics, 1966*, United Nations.
- 1964-66: *Census of Industrial Production, 1966*, National Statistical Office.
- 1967-72: *Industrial Statistics*, United Nations Industrial Development Organization.
- 1973-79: *National Accounts Report, 1973-1979*, National Statistical Office.
- 1980-86: *National Accounts Report, 1980-1986*, National Statistical Office.

Deflator

- 1960-92: GDP Deflator from the International Financial Statistics of the IMF.

MALTA

Agricultural Investment and Total Investment

- 1969-77: *Yearbook of National Accounts Statistics, 1978*, United Nations.
- 1978-82: *Yearbook of National Accounts Statistics, 1982*, United Nations.
- 1983-90: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1991*, United Nations.

Manufacturing Investment

- 1969: *Yearbook of National Accounts Statistics, 1975*, United Nations.
- 1970-74: *Yearbook of National Accounts Statistics, 1980*, United Nations.
- 1975-81: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1985*, United Nations.
- 1982-90: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1992*, United Nations.

Deflator

Agricultural

- 1960-92: GDP Deflator from World Bank National Accounts.

MAURITIUS

Agricultural Investment

- 1955 & 1958-67: *Yearbook of National Accounts Statistics, 1970*, United Nations.
- 1956-57: *Yearbook of National Accounts Statistics, 1963-64*, United Nations.
- 1968-74: *Yearbook of National Accounts Statistics, 1975*, United Nations.
- 1975-78: *Bi-Annual Digest of Statistics, December 1979*, Central Statistical Office, Ministry of Planning and Development, Government of Mauritius.

- 1979-81: *Bi-Annual Digest of Statistics, December 1981*, Central Statistical Office, Ministry of Planning and Development, Government of Mauritius.
- 1982: *Bi-Annual Digest of Statistics, December 1988*, Central Statistical Office, Ministry of Planning and Development, Government of Mauritius.
- 1983: *Statistical Summary, 1984*, Central Statistical Office, Ministry of Planning and Development, Government of Mauritius.
- 1984-85: *Annual Digest of Statistics, 1986*, Central Statistical Office, Ministry of Planning and Development, Government of Mauritius.
- 1986: *Annual Digest of Statistics, 1987*, Central Statistical Office, Ministry of Planning and Development, Government of Mauritius.
- 1987-92: *Quarterly Review, July-December 1993*, Bank of Mauritius.

Manufacturing Investment

- 1953-54: *Yearbook of National Accounts Statistics, 1960*, United Nations.
- 1955-64: *Yearbook of National Accounts Statistics, 1966*, United Nations.
- 1965-72: *Yearbook of National Accounts Statistics, 1975*, United Nations.
- 1973-81: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1983*, United Nations.
- 1982-91: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1992*, United Nations.
- 1992: *Quarterly Review, July-December 1993*, Bank of Mauritius.

Total Investment

- 1955 & 1958-67: *Yearbook of National Accounts Statistics, 1970*, United Nations.
- 1956-57: *Yearbook of National Accounts Statistics, 1963-64*, United Nations.
- 1968-74: *Yearbook of National Accounts Statistics, 1975*, United Nations.
- 1975-78: *Bi-Annual Digest of Statistics, December 1979*, Central Statistical Office, Ministry of Planning and Development, Government of Mauritius.
- 1979-82: *Bi-Annual Digest of Statistics, December 1983*, Central Statistical Office, Ministry of Planning and Development, Government of Mauritius.
- 1983: *Statistical Summary, 1984*, Central Statistical Office, Ministry of Planning and Development, Government of Mauritius.
- 1984-85: *Annual Digest of Statistics, 1986*, Central Statistical Office, Ministry of Planning and Development, Government of Mauritius.
- 1986: *Annual Digest of Statistics, 1987*, Central Statistical Office, Ministry of Planning and Development, Government of Mauritius.
- 1987-92: *Quarterly Review, July-December 1993*, Bank of Mauritius.

Deflator

- 1953-92: GDP Deflator from the International Financial Statistics of the IMF.

MOROCCO

Agricultural Investment and Total Investment

- 1969-77: *Le Maroc en Chiffres, 1977*, Ministere du Plan.
- 1978: *Le Maroc en Chiffres, 1979*, Ministere du Plan.
- 1979: *Le Maroc en Chiffres, 1981*, Ministere du Plan.
- 1980-87: *Le Maroc en Chiffres, 1987*, Ministere du Plan.
- 1988-89: *Le Maroc en Chiffres, 1990*, Ministere du Plan.
- 1990-92: *Le Maroc en Chiffres, 1992*, Ministere des Affaires Economiques et Sociales.

Deflator

- 1964-92: GDP Deflator from IMFIFS.

NETHERLANDS

Agricultural Investment and Total Investment

- 1950-59: *Statistics of National Accounts, 1950-1961*, OECD.
- 1960-69: *National Accounts of OECD Countries, 1960-1971*, OECD.
- 1970-76: *National Accounts, 1976*, OECD.
- 1977-79: *National Accounts, 1970-1982*, OECD.
- 1980-84: *National Accounts, 1973-1985*, OECD.
- 1985-92: *National Accounts, 1980-1992*, OECD.

Manufacturing Investment

- 1953 & 1958-62: *The Growth of World Industry, 1967 Edition*, United Nations.
- 1954-57: Interpolation.
- 1963: *Industrial Statistics, United Nations Industrial Development Organization.*
- 1964-72: *National Accounts of OECD Countries, 1975*, OECD.
- 1973-78: *National Accounts, 1973-85*, OECD.
- 1979-84: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1988*, United Nations.
- 1985-91: *National Accounts, 1981-93*, OECD.
- 1992: *International Yearbook of Industrial Statistics, 1995*, United Nations Industrial Development Organization.

Deflators

Agricultural Investment and Total Investment

- 1950-59: *Statistics of National Accounts, 1950-1961*, OECD.
- 1960-69: *National Accounts of OECD Countries, 1960-1971*, OECD.
- 1970-75: *National Accounts, 1976*, OECD.
- 1976-84: *National Accounts, 1973-1985*, OECD.
- 1985-92: *National Accounts, 1980-1992*, OECD.

NEW ZEALAND

Agricultural Investment

- 1960-67: Johnson, R.W.M., *Capital Formation in New Zealand Agriculture, 1946-67*, Agricultural Economics Unit, Lincoln College, 1970.

- 1968-70: Forecast.
- 1971-79: *National Accounts, 1970-1982*, OECD.
- 1980-89: *National Accounts, 1980-1992*, OECD.

Manufacturing Investment

- 1963-70: Industrial Statistics, United Nations Industrial Development Organization.
- 1971-72: *National Accounts, 1970-1982*, OECD.
- 1973-79: *National Accounts, 1973-1985*, OECD.
- 1980-89: *National Accounts, 1980-1992*, OECD.

Total Investment

- 1960-92: OECD National Accounts.

Deflator

- 1960-92: OECD National Accounts. Total GFCF Deflator.

NICARAGUA

Agricultural Investment, Manufacturing Investment and Total Investment

(Manufacturing Investment is the sum of gross investment in machinery and equipment for industry and mining and private investment in industrial construction.)

- 1960-79: *Indicadores Economicos, December 1979*, Banco Central de Nicaragua.
- 1980-92: Table from Mario Flores of Banco Central de Nicaragua via Ulrich Laechler of the World Bank.

Deflator

- 1960-92: GDP Deflator from World Bank National Accounts.

NORWAY

Agricultural Investment and Total Investment

- 1950-59: *Statistics of National Accounts, 1950-1961*, OECD.
- 1960-69: *National Accounts of OECD Countries, 1960-1971*, OECD.
- 1970-79: *National Accounts, 1970-1982*, OECD.
- 1980-91: *National Accounts, 1980-1992*, OECD.

Manufacturing Investment

- 1950-54: *The Growth of Industry, 1938-1961, National Tables*, United Nations.
- 1955-59: *Yearbook of National Accounts Statistics, 1966*, United Nations.
- 1960-69: *National Accounts Statistics, 1960-1971*, OECD.
- 1970-79: *National Accounts, 1970-1982*, OECD.
- 1980-91: *National Accounts, 1980-1992*, OECD.
- 1992: *International Yearbook of Industrial Statistics, 1995*, United Nations Industrial Development Organization.

Deflators

Agricultural Investment and Total Investment

- 1950-59: *Statistics of National Accounts, 1950-1961*, OECD.
- 1960-69: *National Accounts of OECD Countries, 1960-1971*, OECD.
- 1970-79: *National Accounts, 1970-1982*, OECD.

1980-91: *National Accounts, 1980-1992*, OECD.

PAKISTAN

Agricultural Investment and Total Investment

1965-69 & 1971: *Yearbook of National Accounts Statistics, 1975*, United Nations.

1970 & 1972-79: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1986*, United Nations.

1980-91: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1991*, United Nations.

1992: *Monthly Statistical Bulletin, February 1994*, Federal Bureau of Statistics, Economic Affairs and Statistics Division, Government of Pakistan.

Manufacturing Investment

1969: *Yearbook of National Accounts Statistics, 1975*, United Nations.

1970-74: *Yearbook of National Accounts Statistics, 1980*, United Nations.

1975-79: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1985*, United Nations.

1980 & 1982-92: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1992*, United Nations.

1981: United Nations National Accounts.

Deflator

1965-92: GDP Deflator from World Bank National Accounts.

PERU

Agricultural Investment, Manufacturing Investment and Total Investment

(Manufacturing Investment is industrial equipment and machinery.)

1970-79: Webb, Richard, and Graciela Fernandez Baca de Valdez, *Peru en Numeros, 1990*.

1980-91: Webb, Richard, and Graciela Fernandez Baca de Valdez, *Peru en Numeros, 1992*.

Deflator

1950-91: GDP Deflator from the International Financial Statistics of the IMF.

PHILIPPINES

Agricultural Investment and Total Investment

1967-76: *Philippine Statistical Yearbook, 1979*.

1977-85: *Philippine Statistical Yearbook, 1989*.

1986-89: *Philippine Statistical Yearbook, 1990*.

1990-92: *Philippine Statistical Yearbook, 1993*, National Statistical Coordination Board.

Manufacturing Investment

- 1956: *1956 Annual Survey of Manufactures*, National Economic Council and the Bureau of the Census and Statistics, Republic of the Philippines.
- 1957 & 1978: Interpolation.
- 1958-62: *The Growth of World Industry, 1967 Edition*, United Nations.
- 1963-66, 1968-77, 1979-84 & 1986: *Industrial Statistics*, United Nations Industrial Development Organization.
- 1967: *Economic Census of the Philippines, 1967*, Bureau of the Census and Statistics, Philippines.
- 1985 & 1987-89: *International Yearbook of Industrial Statistics, 1995*, United Nations Industrial Development Organization.

Deflator

- 1950-92: GDP Deflator from the *International Financial Statistics*, International Monetary Fund.

POLAND

Agricultural Investment and Total Investment

- 1956-62: *Yearbook of National Accounts Statistics, 1965*, United Nations.
- 1963-72: *Yearbook of National Accounts Statistics, 1974*, United Nations.
- 1973-83: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1983*, United Nations.
- 1984-90: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1991*, United Nations.

Manufacturing Investment

- 1969-86: *Industrial Statistics*, United Nations Industrial Development Organization.
- 1987-89: *Industrial Statistics Yearbook, 1991*, United Nations.
- 1990-92: *International Yearbook of Industrial Statistics, 1995*, United Nations Industrial Development Organization.

Deflator

Agricultural Investment and Total Investment

- 1956-92: *United Nations National Accounts*.

PORTUGAL

Agricultural Investment

- 1952-54: *Yearbook of National Accounts Statistics, 1958*, United Nations.
- 1955-64: *Yearbook of National Accounts Statistics, 1966*, United Nations.
- 1965-68: *Yearbook of National Accounts Statistics, 1970*, United Nations.
- 1969-76: *Yearbook of National Accounts Statistics, 1978*, United Nations.
- 1977-81: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1985*, United Nations.
- 1982-86: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1991*, United Nations.

- 1987-88: *Estatísticas Agrícolas, 1988*, Instituto Nacional de Estatística, Portugal.
1989: Estimate.
1990-91: *Estatísticas Agrícolas, 1991/1992*, Instituto Nacional de Estatística, Portugal.

Manufacturing Investment

- 1953 & 1955-59: *Yearbook of National Accounts Statistics, 1966*, United Nations.
1954: Interpolation.
1960-70: *National Accounts Statistics, 1960-1971*, OECD.
1971-76: *Yearbook of National Accounts Statistics, 1980*, United Nations.
1977-78: Industrial Statistics, United Nations Industrial Development Organization.
1979-80: *Estatísticas Industriais, 1980*, Instituto Nacional de Estatística, Portugal.
1981-82: *Estatísticas Industriais, 1982*, Instituto Nacional de Estatística, Portugal.
1983-85: *Estatísticas Industriais, 1983-84-85*, Instituto Nacional de Estatística, Portugal.
1986: *Estatísticas Industriais, 1986*, Instituto Nacional de Estatística, Portugal.
1987: *Estatísticas Industriais, 1987*, Instituto Nacional de Estatística, Portugal.
1988: Interpolation.
1989: *Estatísticas Industriais, 1989*, Instituto Nacional de Estatística, Portugal.

Total Investment

- 1952-54: *Yearbook of National Accounts Statistics, 1958*, United Nations.
1955-57: *Yearbook of National Accounts Statistics, 1966*, United Nations.
1958-59: *Yearbook of National Accounts Statistics, 1968*, United Nations.
1960-62 & 1964: *Yearbook of National Accounts Statistics, 1970*, United Nations.
1963, 1965 & 1969-76: *Yearbook of National Accounts Statistics, 1976*, United Nations.
1966-68: *Yearbook of National Accounts Statistics, 1975*, United Nations.
1977-81: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1986*, United Nations.
1982: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1991*, United Nations.
1983-92: World Bank National Accounts.

Deflators

Agricultural and Total

- 1952-92: United Nations National Accounts.

SOUTH AFRICA

Agricultural Investment and Total Investment

- 1950-59: *Statistical Year Book, 1964*, Bureau of Statistics, Republic of South Africa.
- 1960-65: *South African Statistics, 1970*, Department of Statistics, Republic of South Africa.
- 1966-75: *South African Statistics, 1976*, Department of Statistics, Republic of South Africa.
- 1976-81: *South African Statistics, 1986*, Central Statistical Service, Republic of South Africa.
- 1982-84: *South African Statistics, 1990*, Central Statistical Service, Republic of South Africa.
- 1985-92: *South African Statistics, 1993*, Central Statistical Service, Republic of South Africa.

Manufacturing Investment

- 1960 & 1962-64: *Yearbook of National Accounts Statistics, 1973*, United Nations.
- 1961: Interpolation.
- 1965-74: *Yearbook of National Accounts Statistics, 1975*, United Nations.
- 1975-79: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1985*, United Nations.
- 1980-81: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1991*, United Nations.
- 1982-92: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1992*, United Nations.

Deflator

- 1950-92: GDP Deflator from the National Accounts of the International Financial Statistics, International Monetary Fund.

SOUTH KOREA

Agricultural Investment and Total Investment

- 1953-55: *Korea Statistical Yearbook, 1961*.
- 1956-63: *Korea Statistical Yearbook, 1968*.
- 1964-72: *Korea Statistical Yearbook, 1973*.
- 1973-80: *Korea Statistical Yearbook, 1983*.
- 1981-85: *Korea Statistical Yearbook, 1987*.
- 1986-90: *Korea Statistical Yearbook, 1992*.
- 1991-92: Mr. Lin, Bank of Korea.

Manufacturing Investment

- 1953-54: *Yearbook of National Accounts Statistics, 1960*, United Nations.
- 1955: *Yearbook of National Accounts Statistics, 1966*, United Nations.
- 1956-62: *Korea Statistical Yearbook, 1968*.
- 1963-69: *Korea Statistical Yearbook, 1973*.
- 1970-72: *Yearbook of National Accounts Statistics, 1980*, United Nations.

- 1973-78: *National Accounts Statistics: Main Aggregates and Detailed Tables*, 1983, United Nations.
1979-85: *National Accounts Statistics: Main Aggregates and Detailed Tables*, 1988, United Nations.
1986: *Korea Statistical Yearbook*, 1992.
1987-91: *Monthly Bulletin*, 1993.4, The Bank of Korea.

Deflator

- 1953-92: GDP Deflator from the International Financial Statistics, International Monetary Fund.

SRI LANKA

Agricultural Investment and Total Investment

- 1959-68: *Annual Report of the Monetary Board to the Minister of Finance*, 1969, Central Bank of Ceylon.
1969-74: *Annual Report of the Monetary Board to the Minister of Finance*, 1974, Central Bank of Ceylon.
1975-79: *Annual Report of the Monetary Board to the Minister of Finance and Planning*, 1980, Central Bank of Ceylon.
1980-85: *Annual Report*, 1985, Central Bank of Sri Lanka.
1986-92: *Annual Report*, 1993, Central Bank of Sri Lanka.

Manufacturing Investment

- 1975-78: *National Accounts of Sri Lanka, 1975-1982*, Department of Census and Statistics, Ministry of Plan Implementation.
1979-84 & 1986: *Industrial Statistics*, United Nations Industrial Development Organization.
1985 & 1988-90: *International Yearbook of Industrial Statistics*, 1995, United Nations Industrial Development Organization.
1987: *Industrial Statistics Yearbook*, 1991, United Nations.

Deflators

- 1950-59: GDP Deflator from the International Financial Statistics, International Monetary Fund.
1960-92: GDP Deflator from World Bank National Accounts.

SWEDEN

Agricultural Investment and Total Investment

- 1950-59: *Statistics of National Accounts, 1950-1961*, OECD.
1960-69: *National Accounts of OECD Countries, 1960-1971*, OECD.
1970-79: *National Accounts, 1970-1982*, OECD.
1980-92: *National Accounts, 1980-1992*, OECD.

Manufacturing Investment

- 1955-59: *Yearbook of National Accounts Statistics*, 1966, United Nations.
1960 & 1963: *Yearbook of National Accounts Statistics*, 1975, United Nations.
1961-62: *National Accounts Statistics, 1960-1971*, OECD.
1964-69: *National Accounts of OECD Countries, 1975*, OECD.

- 1970-72: *National Accounts, 1970-1982, OECD.*
- 1973-79: *National Accounts, 1973-1985, OECD.*
- 1980: *National Accounts, 1980-1992, OECD.*
- 1981-92: *National Accounts, 1981-1993, OECD.*

Deflators

Agricultural Investment and Total Investment

- 1950-59: *Statistics of National Accounts, 1950-1961, OECD.*
- 1960-69: *National Accounts of OECD Countries, 1960-1971, OECD.*
- 1970-79: *National Accounts, 1970-1982, OECD.*
- 1980-92: *National Accounts, 1980-1992, OECD.*

SYRIA

Agricultural Investment and Total Investment

- 1966-72: *Quarterly Bulletin, Vol. XIII, No. 1-2-3-4, 1974, Central Bank of Syria.*
- 1973-78: *Quarterly Bulletin, Vol. XVIII, No. 3-4, 1979, Central Bank of Syria.*
- 1979-84: *Quarterly Bulletin, Vol. XXIII, No. 1-2-3-4, 1985, Central Bank of Syria.*
- 1985-87: *Quarterly Bulletin, Vol. XXVI, No. 1-2-3-4, 1988, Central Bank of Syria.*
- 1988-92: *Quarterly Bulletin, Vol. XXIX-XXX, No. 1-2-3-4, 1991-1992, Central Bank of Syria.*

Manufacturing Investment

(mining and electricity are included)

- 1961-65: *Yearbook of National Accounts Statistics, 1966, United Nations.*
- 1966-69: *Yearbook of National Accounts Statistics, 1975, United Nations.*
- 1970-79: *Yearbook of National Accounts Statistics, 1980, United Nations.*
- 1980-81: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1991, United Nations.*
- 1982-92: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1992, United Nations.*

Deflator

- 1963-92: GDP Deflator from the International Financial Statistics, International Monetary Fund.

TAIWAN

Agricultural Investment, Manufacturing Investment and Total Investment

- 1951-92: *National Income in Taiwan Area of the Republic of China 1993: National Accounts for 1951-1992, Directorate-General of Budget, Accounting and Statistics, Executive Yuan, Republic of China.*

Deflator

- 1951-91: GDP Deflator from the National Accounts of the International Financial Statistics of the IMF.

- 1992: GDP Deflator from *Quarterly National Economic Trends. Taiwan Area, the Republic of China. August 1994*, Directorate-General of Budget, Accounting and Statistics.

TANZANIA

Agricultural Investment

- 1966-70: *National Accounts of Tanzania, 1964-1972*, Ministry of Economic Affairs and Development Planning.
1971-75: *National Accounts of Tanzania, 1966-76*, Bureau of Statistics, Ministry of Finance and Planning.
1976-80: *National Accounts of Tanzania, 1976-86*, Bureau of Statistics, Ministry of Finance and Planning.
1981-92: *National Accounts of Tanzania, 1976-92*, Bureau of Statistics, Ministry of Finance and Planning.

Manufacturing Investment

- 1966-69: *Yearbook of National Accounts Statistics, 1975*, United Nations.
1970-74: *Yearbook of National Accounts Statistics, 1980*, United Nations.
1975-79: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1985*, United Nations.
1980-91: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1991*, United Nations.

Total Investment

- 1964-70: *National Accounts of Tanzania, 1964-1972*, Ministry of Economic Affairs and Development Planning.
1971-75: *National Accounts of Tanzania, 1966-76*, Bureau of Statistics, Ministry of Finance and Planning.
1976-80: *National Accounts of Tanzania, 1976-86*, Bureau of Statistics, Ministry of Finance and Planning.
1981-92: *National Accounts of Tanzania, 1976-92*, Bureau of Statistics, Ministry of Finance and Planning.

Deflator

- 1960-92: GDP Deflator from World Bank National Accounts.

TRINIDAD AND TOBAGO

Agricultural Investment

- 1966-82: *The National Income of Trinidad and Tobago, 1966-1985*, Central Statistical Office, Republic of Trinidad and Tobago.
1983-89: *The National Income of Trinidad and Tobago, 1981-1991*, Central Statistical Office, Republic of Trinidad and Tobago.
1990: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1992*, United Nations.

Manufacturing Investment

- 1966-80: *The National Income of Trinidad & Tobago, 1966-1985*, Central Statistical Office.

- 1981-89: *The National Income of Trinidad & Tobago, 1981-1991*, Central Statistical Office.
 1990: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1992*, United Nations.

Total Investment

- 1966-80: *The National Income of Trinidad and Tobago, 1966-1985*, Central Statistical Office, Republic of Trinidad and Tobago.
 1981-89: *The National Income of Trinidad and Tobago, 1981-1991*, Central Statistical Office, Republic of Trinidad and Tobago.
 1990-92: *World Tables, 1995*, The World Bank.

Deflators

- 1966-91: GDP Deflator from the International Financial Statistics, International Monetary Fund.
 1992: Applied World Bank, *World Tables 1991-1992*, GDP Deflator growth rate to 1991 Deflator from the International Financial Statistics, International Monetary Fund.

TUNISIA

Agricultural Investment and Total Investment

- 1960-61: *Yearbook of National Accounts, 1970*, United Nations.
 1962-71: *Statistiques Financieres, February 1974*, Banque Centrale de Tunisie.
 1972-78: *Statistiques Financieres, March 1983*, Banque Centrale de Tunisie.
 1979-87: *Statistiques Financieres, September 1990*, Banque Centrale de Tunisie.
 1988-92: *Statistiques Financieres, September 1993*, Banque Centrale de Tunisie.

Manufacturing Investment

- 1962-64: *Statistiques Financieres, February 1974*, Banque Centrale de Tunisie.
 1965-74: *Yearbook of National Accounts Statistics, 1975*, United Nations.
 1975-81: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1985*, United Nations.
 1982-86: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1992*, United Nations.
 1987-92: *Statistiques Financieres, September 1993*, Banque Centrale de Tunisie.

Deflators

- 1960: GDP Deflator from *Yearbook of National Accounts Statistics, 1970*, United Nations.
 1961-92: GDP Deflator from World Bank National Accounts.

TURKEY

Agricultural Investment

- 1963-75: Computed From....
 (1) Ag-To-Total GFCF Ratio from *The Turkish Economy, 1980* by Turkish Industrialists and Businessmen's Association; and
 (2) Total GFCF, see below.
 1976: *1977 Annual Report*, State Investment Bank.

- 1977: 1978 *Annual Report*, State Investment Bank.
- 1978: 1979 *Annual Report*, State Investment Bank.
- 1979: 1980 *Annual Report*, State Investment Bank.
- 1980: 1981 *Annual Report*, State Investment Bank.
- 1981: 1982 *Annual Report*, State Investment Bank.
- 1982: 1983 *Annual Report*, State Investment Bank.
- 1983: 1984 *Annual Report*, State Investment Bank.
- 1984-92: National accounts tables from the State Planning Organization of Turkey obtained through Sebnem Akkaya of the World Bank.

Manufacturing Investment

- 1963-75: *The Turkish Economy: Prospects for Growth within Stability, 1978*, Turkish Industrialists and Businessmen's Association.
- 1976: 1977 *Annual Report*, State Investment Bank, Turkey.
- 1977: 1978 *Annual Report*, State Investment Bank, Turkey.
- 1978: 1979 *Annual Report*, State Investment Bank, Turkey.
- 1979: 1980 *Annual Report*, State Investment Bank, Turkey.
- 1980: 1981 *Annual Report*, State Investment Bank, Turkey.
- 1981: 1982 *Annual Report*, State Investment Bank, Turkey.
- 1982: 1983 *Annual Report*, State Investment Bank, Turkey.
- 1983: 1984 *Annual Report*, State Investment Bank, Turkey.
- 1984-91: National accounts tables from the State Planning Organization of Turkey obtained through Sebnem Akkaya of the World Bank.
- 1992: *Annual Report, 1993*, Central Bank of the Republic of Turkey.

Total Investment

- 1960-69: *National Accounts Statistics, 1960-1971*, OECD.
- 1970-79: *National Accounts, 1970-1982*, OECD.
- 1980-92: *National Accounts, 1980-1992*, OECD.

Deflator

- 1960-92: GDP Deflator from the International Financial Statistics, International Monetary Fund.

UNITED KINGDOM

Agricultural Investment and Total Investment

- 1950-59: *Statistics of National Accounts, 1950-1961*, OECD.
- 1960-69: *National Accounts of OECD Countries, 1960-1971*, OECD.
- 1970-79: *National Accounts, 1970-1982*, OECD.
- 1980-91: *National Accounts, 1980-1992*, OECD.

Manufacturing Investment

- 1948 & 1951-54: *The Growth of World Industry, 1938-61, National Tables*, United Nations.
- 1949: Interpolation.
- 1950 & 1955-59: *Yearbook of National Accounts Statistics, 1964*, United Nations.
- 1960-61: *National Accounts Statistics, 1960-1971*, OECD.

- 1962-64: *Yearbook of National Accounts Statistics, 1973*, United Nations.
- 1965-69: *National Accounts of OECD Countries, 1975*, OECD.
- 1970-72: *National Accounts, 1970-1982*, OECD.
- 1973-79: *National Accounts, 1973-1985*, OECD.
- 1980-91: *National Accounts, 1980-1992*, OECD.
- 1992: *United Kingdom National Accounts 1994*, Central Statistical Office.
Great Britain.

Deflators

Agricultural Investment and Total Investment

- 1950-59: *Statistics of National Accounts, 1950-1961*, OECD.
- 1960-69: *National Accounts of OECD Countries, 1960-1971*, OECD.
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Deflators

Agricultural and Total

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Agricultural Investment and Total Investment

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1983-92: *Boletin Estadistico, No. 166, September 1994*, Banco Central del Uruguay.

Deflator

1955-92: GDP Deflator from the International Financial Statistics, International Monetary Fund.

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Agricultural Investment

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- 1970-76: *Yearbook of National Accounts Statistics, 1980*, United Nations.
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- 1980: Interpolation.
- 1987-89: *Industrial Statistics Yearbook, 1991*, United Nations.
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1986-92: World Bank World Tables, 1995.

Deflator

1950-92: GDP Deflator from the International Financial Statistics, International Monetary Fund.

ZIMBABWE (FORMER RHODESIA)

Agricultural Investment and Total Investment

1954-64: *National Accounts and Balance of Payments of Rhodesia, 1954-64*, Central Statistical Office.

1965-67: *National Accounts and Balance of Payments of Rhodesia, 1971*, Central Statistical Office.

1968-73: *National Accounts of Rhodesia, 1976*, Central Statistical Office.

1974-80: *Statistical Yearbook of Rhodesia, 1985*, Central Statistical Office.

1981-89: *Quarterly Digest of Statistics, March 1994*, Central Statistical Office.

Manufacturing Investment

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1955-64: *Yearbook of National Accounts Statistics, 1966*, United Nations.

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1975-81: *National Accounts Statistics: Main Aggregates and Detailed Tables, 1985*, United Nations.

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Deflators

1954-59: GDP Deflator computed from *National Accounts and Balance of Payments of Rhodesia, 1954-64*.

1960-92: GDP Deflator computed from World Bank National Accounts.

Annex II: Program to calculate agricultural capital, written by Al Crego, 1996.

Note: Total fixed capital and manufacturing capital stocks are obtained in the same way as agricultural fixed capital.

PROGRAM

```
options ls=78;
libname datadir '[';

/* Orchards. */

/* Input data on area harvested (land), prices
(p) and */
/* output (q) by commodity for each
country. Also input */
/* data on nominal exchange rates (x) since
prices are */
/* expressed in nominal local currencies. */
/* note 67-92 suffixes indicate observation*/
/* year */
data land; set datadir.land;
keep cou com land67-land92;

data prodn; set datadir.prodn;
keep cou com p67-p92 q67-q92 x67-x92;

proc sort data=land; by cou com;
proc sort data=prodn; by cou com;

data pv; merge land prodn; by cou com;
array land{*} land65-land94;
array q{*} q65-q94;
array p{*} p65-p94;
array x{*} x65-x94;
array yield{*} yield65-yield94;
array avgp{*} avgp65-avgp94;
array avgy{*} avgy65-avgy94;
array dollacre{*} dolacr65-dolacr94;

/* Convert prices to nominal US$. */
do h=3 to 28;
  p{h}=p{h}*x{h};
end;

/* Compute yield as output per hectare. */
do i=3 to 28;
  yield{i}=q{i}/land{i};
end;

if nmiss(of yield67-yield92) ne 26;

p65=.;p66=.;p93=.;p94=.;
yield65=.;yield66=.;yield93=.;yield94=.;

/* Compute moving averages of prices and
yields. From */
/* these, compute the dollar value per
hectare for a */
/* specific period using the assumption that
profits from */
/* tree crops are 20% of revenues. */
do j=3 to 28;
  avgp{j}=mean(of p{j-2} p{j-1} p{j}
p{j+1} p{j+2});
  avgy{j}=mean(of yield{j-2} yield{j-1}
yield{j} yield{j+1} yield{j+2});
  dollacre{j}=(avgp{j}*avgy{j})*(0.2);
end;
keep cou com dolacr67-dolacr92 land67-
land92;

/* Restrict data set to tree crops. */
data pv; set pv;
if substr(com,1,1)='t';
dummy=9999;

/* Input data on US nominal interest rates. */
data bondrate; set datadir.bondrate;
dummy=9999;
keep dummy brate67-brate92;

/* Input data on US gdp deflators and
compute inflation */
/* rate. */
data inflate; set datadir.gdp_def; if
cou='USA';
gdpdef93=gdpdef92*(1+0.0219);
array deflator{*} gdpdef67-gdpdef93;
array inflate{*} inflat67-inflat92;
do i=1 to dim(inflate);
```

```

inflate{i}=((deflator{i+1}-
deflator{i})/deflator{i+1})*100;
end;
dummy=9999;
keep dummy inflat67-inflat92;

/* Convert nominal interest rates to real
interest rates. */
data bondrate; merge bondrate inflate; by
dummy;
array inflate{*} inflat67-inflat92;
array bondrate{*} brate67-brate92;
do i=1 to dim(bondrate);
    bondrate{i}=(bondrate{i}-inflate{i})/100;
end;
lifetime=26;
keep dummy lifetime brate67-brate92;

/* Compute the present value per orchard
hectare as the */
/* discounted stream of future profits it will
yield */
/* through production using the simplifying
assumption */
/* that at any point in time the average tree
is halfway */
/* through with its assumed lifetime. */
data pv; merge pv bondrate; by dummy; drop
dummy;
array land{*} land67-land92;
array bondrate{*} brate67-brate92;
array dollacre{*} dolacr67-dolacr92;
array presvalu{*} preval67-preval92;
array treecap{*} trecap67-trecap92;
do i=1 to dim(bondrate);
    presvalu{i}=0;
    do j=1 to (lifetime/2);

presvalu{i}=presvalu{i}+((dollacre{i})*(ex
p((-bondrate{i})*(j-1))));
    end;
end;

/* Compute the total present value of the
orchards for */
/* each tree crop by multiplying the per
hectare present */

/* value by the area harvested. */
do k=1 to dim(treecap);
    treecap{k}=presvalu{k}*land{k};
end;

/* The total value of the orchards in nominal
US$ is */
/* obtained by summing over the present
values for all */
/* tree crops. */
proc summary data=pv nway;
    class cou;
    var trecap67-trecap92;
    output out=pv sum=;

/* Input data on values of livestock in
nominal US $. */
/* Sum over values of different types of
livestock to */
/* obtain aggregate livestock measure for
each country. */
proc summary data=datadir.livstok1 nway;
    class cou;
    var value67-value92;
    output out=livstok sum=;

proc sort data=pv; by cou;
data pv; set pv; keep cou trecap67-trecap92;

proc sort data=livstok; by cou;
data livstok; set livstok; keep cou
value67-value92;

/* "Other capital" is the sum of livestock
and orchards. */
data pv; merge pv livstok; by cou;
array treecap{*} trecap67-trecap92;
array value{*} value67-value92;
array othcap{*} othcap67-othcap92;
do i=1 to dim(value);
    othcap{i}=sum(of treecap{i} value{i});
end;

```

Program to calculate capital stocks (continued)

```

/* Fixed Capital Part Begins ... */

/* Input data on gdp in agriculture in
constant local */
/* currencies. */
data aggdp; set datadir.capagdp;
if realnom='KP';
keep cou aggdp13-aggdp92;

/* Input data on agricultural investment in
constant */
/* local currencies. "beg" and "end" are
variables that */
/* note the beginning and ending years of
the investment */
/* series. */
data ainvest; set datadir.ainvest;
keep cou year1913-year1992 beg end;

/* Backcast the investment series. Run
regressions of */
/* the logs of gdp and the ratio of investment
to gdp */
/* on time. Use the estimated parameters to
simulate */
/* these series backwards in time. Calculate
*/
/* investment back to 1913. */
proc sort data=aggdp; by cou;
proc sort data=ainvest; by cou;

data ainvest; merge aggdp ainvest; by cou;
array aggdp{*} aggdp13-aggdp92;
gdp_beg=0;
do i=1 to dim(aggdp);
  if aggdp{i}= . then gdp_beg=gdp_beg+0;
  if aggdp{i} ne . and gdp_beg=0 then
    gdp_beg=i+1912;
  if aggdp{i} ne . and gdp_beg gt 0 then
    gdp_beg=gdp_beg;
end;
keep cou year1913-year1992 aggdp13-
aggdp92 beg end gdp_beg;

data ainvest; set ainvest;
array invest{*} year1913-year1992;
array agincome{*} aggdp13-aggdp92;
do i=1 to dim(invest);
  ainvest=invest{i};

  aggdp=agincome{i};
  year=1912+i;
  output;
end;
keep year cou ainvest aggdp beg end
gdp_beg;

data ainvest; set ainvest;
if year lt beg then ratio=0; else
  ratio=ainvest/aggdp;
if ratio=0 then log_rat=.; else
  log_rat=log(ratio);
if aggdp=0 then log_gdp=.; else
  log_gdp=log(aggdp);

proc sort data=ainvest; by cou year;

proc model data=ainvest noprint;
  by cou;
  endogenous log_rat log_gdp;
  exogenous year;
  parms a b c d;
  log_rat=a+b*year;
  log_gdp=c+d*year;
  fit log_rat log_gdp / ols outest=outsim;

proc sort data=outsim; by cou;
proc sort data=ainvest; by cou;

data ainvest; merge ainvest outsim; by cou;
if log_rat= . then log_rat=a+b*year;
if log_gdp= . then log_gdp=c+d*year;
fakeinv=(exp(log_gdp))*(exp(log_rat));
if ainvest= . then ainvest=fakeinv;
keep cou year ainvest beg end;

/* This program calculates capital stocks by
applying the */
/* Ball, Bureau, Butault and Witzke (1993)
method to */
/* investment data for each country. */
/* The program requires the user to input the
desired */
/* mean and variance from the normal
distribution (from */
/* which capital assets' service lives derive)
in */

```

```

/* addition to the parameter, 'Beta',
governing the */
/* physical decay of assets. */

/* The output of the block which
immediately follows is */
/* the data set called WEIGHTS. Assets
have the same */
/* mean life, but, following the truncated
normal */
/* distribution, different assets will have
lifetimes */
/* longer and shorter than the mean.
WEIGHTS contains */
/* the probability that any particular asset
will */
/* actually live for any specified time
period. The */
/* variable 'pmeanlif' is assigned probability
that any */
/* asset will have a lifetime equal to the
mean lifetime, */
/* plus or minus half of a year. 'prsub1' is
the */
/* probability that any asset will have a
lifetime from */
/* 1.5 to 0.5 years below the mean. 'prsub2'
is the */
/* probability that any asset will have a
lifetime from */
/* 2.5 to 1.5 years below the mean, and so
on. 'prsup1' */
/* is the assigned probability that any asset
will have a */
/* lifetime from 0.5 to 1.5 years greater than
the mean, */
/* 'prsup2' is the probability that any asset
will live */
/* between 1.5 and 2.5 years above the mean
lifetime, and */
/* so on. In addition to the variables prsub1-
prsub99, */
/* pmeanlif, and prsup1-prsup99,
WEIGHTS contains the */
/* underlying parameters Beta and the mean
and variance */
/* of the truncated normal distribution from
which all */
/* probabilities are derived. */

```

```

/******
*****/
/* 8 LINES BELOW, IMMEDIATELY
AFTER THE CARDS STATEMENT, */
/* THE USER MUST ENTER,
RESPECTIVELY, THE DESIRED DECAY
*/
/* PARAMETER (BETA), THE MEAN
(MU), AND THE STANDARD */
/* DEVIATION (SIGMA). */
/******
*****/

```

```

/* For the case of agricultural capital and
total */
/* capital, the following parameters were
assigned: */
/* beta=.7, mu=20 and sigma=8. */
/* For manufacturing capital: beta=.7,
mu=15 and sigma=6. */

```

```

data weights;
input beta mu sigma;
cards;
.7 20 8
;

```

```

data weights; set weights;
keep beta mu sigma prsub1-prsub99
pmeanlif prsup1-prsup99;
xlow=mu-
(2*sigma)+(0.5); xhigh=mu+(2*sigma)-
(0.5);
zlow=(xlow-mu)/sigma; zhigh=(xhigh-
mu)/sigma;
taillow=probnorm(zlow);
tailhigh=probnorm(zhigh);
denom=tailhigh-tailow;

array sub{*} sub1-sub100;
do i=1 to 100;
sub{i}=mu-i+(0.5);
end;

array subpr{*} subpr1-subpr100;
subpr1=(1/denom)*(probnorm((mu-
mu)/sigma)-probnorm((sub1-mu)/sigma));
do i=2 to 100;

```


Program to calculate capital stocks (continued)

```

    subpr{i}=(1/denom)*(probnorm((sub{i}-
1)-mu)/sigma)
                                -probnorm((sub{i}-
mu)/sigma));
    end;

    array subzero{*} subz1-subz100;
    do i=1 to 100;
        subzero{i}=0;
    end;

    array below{*} below1-below100;
    do i=1 to 100;
        if sub{i} lt xlow then
below{i}=subzero{i};
        else below{i}=subpr{i};
    end;

    array lifeprob{*} prsub1-prsub99 pmeanlif
prsup1-prsup99;
    pmeanlif=2*below1;
    do i=2 to 100;
        lifeprob{i-1}=below{i};
    end;
    do i=2 to 100;
        lifeprob{i+99}=below{i};
    end;

/* Below, the variables freq1-freq199 are
created, each */
/* of which correspond, respectively, to the
variables */
/* life1-life199. 'life100' is assigned to be
the mean */
/* lifetime (plus or minus half of a year).
'life101' is */
/* an asset lifetime which is between one
half and one */
/* and one half years greater than the mean
lifetime. */
/* 'life102' is an asset lifetime which is
between 1.5 */
/* and 2.5 years greater than the mean life,
and so on. */
/* 'life99' is an asset lifetime which is
between 1.5 */
/* and 0.5 years less than the mean life,
'life98' is */

/* an asset lifetime which is between 2.5 and
1.5 years */
/* less than the mean life of assets. 'freq1-
freq199' */
/* are the probabilities associated with asset
lifetimes */
/* 'life1-life199'. */

data service; set weights;
    keep mu sigma beta dummy freq1-freq199
life1-life199;
    array lifeprob{*} prsub1-prsub99 pmeanlif
prsup1-prsup99;
    array freq{*} freq1-freq199;
    do i=1 to 99;
        freq{i}=lifeprob{100-i};
    end;
    freq{100}=lifeprob{100};
    do i=101 to 199;
        freq{i}=lifeprob{i};
    end;

    array lifetime{*} life1-life199;
    lifetime{100}=mu;
    do i=1 to 99;
        lifetime{i}=mu-(100-i);
    end;
    do i=1 to 99;
        lifetime{100+i}=mu+(i);
    end;
    dummy=9999;

data year;
array years{*} yr1851-yr1992;
yr1851=1851;
do z=2 to dim(years);
    years{z}=years{z-1}+1;
end;
keep yr1851-yr1992;

data year;set year;
array years{*} yr1851-yr1992;
do z=1 to dim(years);
    year=years{z};
    dummy=9999;
output;
end;
keep year dummy;

```

Program to calculate capital stocks (continued)

```
data service; merge service year; by dummy;
drop dummy;
proc delete data=weights;

/* Below, the data set 'service' contains the
time paths */
/* of services generated by a single capital
asset. */
/* Take, for example, the year j, service{z}
element. */
/* This is the efficiency (or service from 1
asset) in */
/* year z of assets which were new in year j.
*/

data service; set service;
keep year beta mu sigma serv1851-
serv1992;
array lifetime{*} life1-life199;
array freq{*} freq1-freq199;
array service{*} serv1851-serv1992;
do i=1 to dim(service);
  service{i}=0;
  do j=1 to dim(lifetime);
    if (lifetime{j}-(i-_n_)) le 0 or
      (lifetime{j}-(beta*(i-_n_))) le 0 then
      service{i}=service{i}+0;
    else
      service{i}=service{i}+(freq{j})*(lifetime{j}
      -(i-_n_))
      *(1/(lifetime{j}-(beta*(i-_n_))));
    if year gt (i+1850) then service{i}=0;
  end;
end;

data service; set service;
if year ge 1913;
keep year beta mu sigma serv1913-
serv1992;

proc sort data=service; by year;
proc sort data=ainvest; by year;

data ainvest; merge service ainvest; by year;
array service{*} serv1913-serv1992;
array capital{*} cap1913-cap1992;
do i=1 to dim(service);
  capital{i}=service{i}*ainvest;

end;
keep year cou beta mu sigma cap1913-
cap1992;

/* The following calculates the capital
stocks, by */
/* country, in each year by summing over
the */
/* contributions from each year. */

proc summary data=ainvest nway;
  class cou;
  var cap1913-cap1992;
  output out=astocks sum=;

data astocks; set astocks;
keep cou cap1913-cap1992;
* Fixed Capital Stock in Constant Local
Currency;

/* Input data on the total capital deflator to
convert */
/* capital stock data to nominal local
currencies. */
data deflator; set datadir.deflator;
keep cou def1913-def1992;

proc sort data=deflator; by cou;

data astocks; merge astocks deflator; by cou;
array deflator{*} def1913-def1992;
array real{*} cap1913-cap1992;
array nomfixed{*} fixcap13-fixcap92;
do i=1 to dim(deflator);
  nomfixed{i}=((real{i})*(deflator{i}))/100;
end;
keep cou fixcap67-fixcap92;
* Fixed Capital Stock in Nominal Local
Currency;

/* Input data on nominal exchange rates to
convert */
/* capital stock data to nominal US $. */
data prodn; set prodn;
if cou ne lag(cou);
keep cou x67-x92;

data astocks; merge astocks prodn; by cou;
```

Program to calculate capital stocks (continued)

```
array nomfixed{*} fixcap67-fixcap92;
array exchange{*} x67-x92;
do i=1 to dim(exchange);
  nomfixed{i}=nomfixed{i}*exchange{i};
end;
keep cou fixcap67-fixcap92;
* Fixed Capital Stock in Nominal US$;

proc sort data=pv; by cou;

/* Sum fixed capital and other capital
(livestock and */
/* orchards) to obtain total value of
agricultural */
/* capital in nominal US$. */
data astocks; merge pv astocks; by cou;
array nomfixed{*} fixcap67-fixcap92;
array othercap{*} othcap67-othcap92;
array totcap{*} totcap67-totcap92;
do i=1 to dim(nomfixed);
  totcap{i}=sum(of nomfixed{i}
othercap{i});
end;
dummy=9999;
keep cou fixcap67-fixcap92 value67-
value92 trecap67-trecap92 othcap67-
othcap92 totcap67-totcap92 dummy;
* Agricultural Capital Stock in Nominal
US$;

/* Input data on US gdp deflators to convert
capital */
/* stock measures to constant US$. */
data usdefl; set datadir.gdp_def; if
cou='USA';

dummy=9999; keep gdpdef67-gdpdef92
dummy;

data astocks; merge astocks usdefl; by
dummy;
if nmiss(of totcap67-totcap92) lt 26;
array fixcap{*} fixcap67-fixcap92;
array livestok{*} value67-value92;
array trees{*} trecap67-trecap92;
array othcap{*} othcap67-othcap92;
array totalcap{*} totcap67-totcap92;
array deflator{*} gdpdef67-gdpdef92;
do i=1 to dim(deflator);
  if deflator{i}= . or deflator{i}=0 then
fixcap{i}=.;
  else fixcap{i}=(fixcap{i}/deflator{i})*100;
  if deflator{i}= . or deflator{i}=0 then
livestok{i}=.;
  livestok{i}=(livestok{i}/deflator{i})*100;
  if deflator{i}= . or deflator{i}=0 then
trees{i}=.;
  trees{i}=(trees{i}/deflator{i})*100;
  if deflator{i}= . or deflator{i}=0 then
othcap{i}=.;
  othcap{i}=(othcap{i}/deflator{i})*100;
  if deflator{i}= . or deflator{i}=0 then
totalcap{i}=.;
  totalcap{i}=(totalcap{i}/deflator{i})*100;
end;
keep cou fixcap67-fixcap92 value67-
value92 trecap67-trecap92 othcap67-
othcap92 totcap67-totcap92;
* Agricultural Capital in 1990 US$;
```

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